

**MARTIN MARIETTA**

**ORNL  
MASTER COPY**

**ES/ER/TM-76**

**ENVIRONMENTAL  
RESTORATION  
PROGRAM**

**Toxicity Values  
for Use in Hazardous Waste  
Risk Assessment and Remediation**

**Biomedical and Environmental  
Information Analysis Section**

**MANAGED BY  
MARTIN MARIETTA ENERGY SYSTEMS, INC.  
FOR THE UNITED STATES  
DEPARTMENT OF ENERGY  
UCN-17580 (6 7-91)**

**ENERGY SYSTEMS  
ER  
>>>**

**TOXICITY VALUES FROM THE U.S. ENVIRONMENTAL  
PROTECTION AGENCY INTEGRATED RISK INFORMATION  
SYSTEM AND HEALTH EFFECTS ASSESSMENT SUMMARY TABLE**

**OCTOBER 1994**

Prepared by

CHEMICAL HAZARD EVALUATION GROUP  
BIOMEDICAL AND ENVIRONMENTAL INFORMATION ANALYSIS SECTION  
HEALTH SCIENCES RESEARCH DIVISION  
OAK RIDGE NATIONAL LABORATORY\*

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\*Managed by Martin Marietta Energy Systems, Inc., for the U.S. Department of Energy under  
Contract No. DE-AC05-84OR21400

U. S. DEPARTMENT OF ENERGY  
**RECOMMENDATIONS FOR THE ANNOUNCEMENT AND DISTRIBUTION  
OF DEPARTMENT OF ENERGY (DOE) SCIENTIFIC AND TECHNICAL INFORMATION (STI)**  
(See instructions on reverse side. Use plain bond paper if additional space is needed for explanations.)

**PART I** (DOE, DOE Contractors, Grantees, and Awardees complete)

**A. Product/Report Data**

1. (Award) Contract No. DE-AC05-84OR21400

2. Title Toxicity Values from the U.S. Environmental Protection Agency Integrated Risk Information System, and Health Effects Assessment Summary Table

3. Product/Report Description

a. Report (Complete all that apply)

- (1)  Print  Nonprint (specify) \_\_\_\_\_  
(2)  Quarterly  Semiannual  Annual  Final  
 Topical  Phase I  Phase II  
 Other (specify) \_\_\_\_\_

Dates covered \_\_\_\_\_ thru \_\_\_\_\_

b. Conference/Meeting/Presentation (Complete all that apply)

- (1)  Print  Nonprint (specify) \_\_\_\_\_  
 Published proceedings  
 Other (specify) \_\_\_\_\_

(2) Conference Title (no abbreviations) \_\_\_\_\_

Location (city/state/country) \_\_\_\_\_

Date(s) (m/d/y) / / thru (m/d/y) / /

Sponsor \_\_\_\_\_

**PART II** (DOE/DOE Contractors complete/or as instructed by DOE contracting off.

**C. DOE Identifiers**

Product/Report Nos. ES/ER/TM-76

UCNI)

Funding Office(s) (NOTE: Essential data) EW 10 20 30 1

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c. Software—Additional forms are required. Follow instructions on the back of this form.

d. Other (Provide complete description) \_\_\_\_\_

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Yes No

e. Is any new equipment, process, or material disclosed?  
If yes, identify page numbers \_\_\_\_\_

f. Has an invention disclosure been submitted?

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Submitted to \_\_\_\_\_

g. Are there patent-related objections to the release of this STI product? If so, state the objections. \_\_\_\_\_

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Release date / /  
 (3) Other (explain) \_\_\_\_\_

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A. Patent Clearance ("X" one)

- Has been submitted for DOE patent clearance  
 DOE patent clearance has been granted

B. Released by

Name D.R. Hamrin

Signature *D.R. Hamrin/JJ*

Phone (615) 574-6752

Date 7-15-08

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**MARTIN MARIETTA ENERGY SYSTEMS, INC.**POST OFFICE BOX 2008  
OAK RIDGE, TENNESSEE 37831

November 17, 1994

Distribution

**Distribution of Risk Assessment Toxicity Values**

Enclosed with this letter you will find tables of toxicity values (reference doses, reference concentrations and slope factors for ingestion and inhalation exposure routes) which are compiled from the U.S. Environmental Protection Agency (EPA) Integrated Risk Information System (IRIS) and Health Effects Assessment (HEAST) tables. These values are to be used in risk assessments at all Department of Energy-Oak Ridge/Environmental Restoration Division (DOE-OR/ERD) sites. The update distributed in August 1994 should be replaced with these revised tables.

In addition, this revision includes dermal risk values (pages 7.1-9.3) which have been calculated by the Biomedical and Environmental Information Analysis Section (BEIAS) of the Health Sciences Research Division (HSRD) at Oak Ridge National Laboratory (ORNL) using EPA methodology. These values have not been through the U.S. EPA review process for approval; however, in order to ensure consistency in risk assessments at all DOE-OR/ERD sites these values are being provided. An explanation of the method used to calculate these dermal risk values is attached. After some discussion, we have determined that the gastrointestinal absorption value of inorganic salts of mercury would be more appropriate at the 7% absorption than the .01% cited for elemental mercury; therefore, I am enclosing the letter that was provided by the BEIAS for your information and use. This letter provides references for the 7% absorption for inorganic salts of mercury. The gastrointestinal absorption value for mercury was reevaluated after the dermal pathway for mercury was found to be dramatically higher than the oral ingestion pathway for mercury. Therefore, an evaluation of all gastrointestinal absorption values for other metals is currently underway. In the meantime, if you have risk assessments in which the dermal pathway for metals is driving the risk, please contact me and we will conduct a case-by-case review of the particular dermal value until all metals have been evaluated. If you have any questions regarding the enclosed dermal risk values, please do not hesitate to give me or your Risk Assessment Team Leader (RATL) a call.

Because all DOE-OR/ERD risk assessments must be consistent, these values should be used until you receive the next update. The table will be updated by the BEIAS of the HSRD at ORNL approximately one month after the latest updates of the HEAST. In the interim, you will also receive information concerning critical IRIS updates.

We recognize that new toxicity values and applicable or relevant and appropriate requirements (ARARs) continue to develop, and we will incorporate that new information into the central database as quickly as possible. If you become aware of new toxicity values or ARARs that you believe should be reflected in the database, please advise your RATL of the new information. The RATL will notify the appropriate Risk Assessment Council (RAC) personnel who will follow up on the information and decide whether the database should be modified. In addition, we recognize that there is some potential for error in these tables; should you discover mistakes, please use the same notification procedure to ensure that any errors are corrected.

**To maintain quality assurance and ensure consistency of all DOE-OR/ERD risk assessments, it is**

**essential that we begin formally controlling toxicity values that are distributed through the RAC; therefore, a Transmittal Receipt that you need to sign and return indicating your receipt of the above-mentioned document is included. Please return the form to us upon receipt. Retain a copy of the signed acknowledgement form for your manual. If you no longer need this document, please return this document.**

If you have questions or comments concerning the toxicity values, please do not hesitate to contact me (241-2367).

Sincerely,



Sarah Kerr

RAC Technical Coordinator

Enclosures (3)

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Oral toxicity data are available for many chemicals thus enabling Oral Reference Doses (RfD) for noncarcinogenic effects and slope factors ( $q_1$ ) for carcinogenic effects to be calculated. In contrast, dermal toxicity data for long-term exposure are not available for most chemicals, thus precluding the calculation of dermal RfDs and slope factors. However, the health risks from dermal exposure to chemicals can be characterized by modification of the oral RfD or slope factor by a chemical-specific gastrointestinal absorption factor (ABS<sub>GI</sub>). This transforms the administered doses (oral RfDs and slope factors) into absorbed doses which can then be compared to intake amounts determined from dermal exposures. Conversion from administered doses to absorbed doses was accomplished as follows (U.S. EPA. 1992. Dermal Exposure Assessment: Principles and Applications. Interim Report. Office of Health and Environmental Assessment. Washington, DC. EPA/600/6-91011B.):

$$\begin{aligned} \text{RfD}_{\text{absorbed}} &= \text{RfD}_{\text{administered}} \times \text{ABS}_{\text{GI}} \\ q_1_{\text{absorbed}} &= q_1_{\text{administered}} / \text{ABS}_{\text{GI}} \end{aligned}$$

These values have not been through the U.S. EPA review process for approval. For additional information concerning dermal risk values and the selection of appropriate gastrointestinal absorption factors contact: Chemical Hazard Evaluation Group, Biomedical and Environmental Information Analysis Section, Health Sciences Research Division, Oak Ridge National Laboratory, Oak Ridge, TN. 615-574-7581.

**Internal Correspondence**

MARTIN MARIETTA ENERGY SYSTEMS, INC.

**DATE:** November 10, 1994**TO:** S. B. Kerr, Risk Analysis**FROM:** R.H. Ross, R.A. Young, 1060 Commerce, MS-8460, 4-4573**SUBJECT:** Gastrointestinal Absorption of Inorganic Salts of Mercury

Currently available data indicate that the gastrointestinal absorption of inorganic salts of mercury is less than 15% in mice and about 7% in humans (Clarkson, 1989; Goyer, 1991). If mercury contamination is in the form of an inorganic salt, the 7% absorption would be more appropriate than the 0.01% value cited for elemental mercury.

Clarkson, T.W. 1989. Mercury. J. Amer. Coll. Toxicol. 8:1291-1295.

Goyer, R.A. 1991. Toxic Effects of Metals. In: Amdur, M.O., J.D. Doull, C.D. Klaassen, Eds. *Casarett and Doull's Toxicology*, 4th ed., pp. 623-680. Pergamon Press, New York.

RAY:gi

## LIST OF TABLES

### LIST OF CHANGES IN TOXICITY VALUES FROM JULY 1994 VERSION

#### SECTION ONE

Chemical Compounds Found in IRIS and HEAST in Chemical Order

Chemical Compounds Found in IRIS and HEAST in CAS Number Order

#### SECTION TWO

Summary of Reference Doses (RfD), Reference Concentrations (RfC), Slope Factors ( $q_1^*$ ), Unit Risks, and EPA Cancer Classification From IRIS and HEAST in Chemical Order

Summary of Reference Doses (RfD), Reference Concentrations (RfC), Slope Factors ( $q_1^*$ ), Unit Risks, and EPA Cancer Classification From IRIS and HEAST in CAS Number Order

#### SECTION THREE

Radionuclide Carcinogenicity From HEAST — Slope Factors In Picocuries

Radionuclide Carcinogenicity From HEAST — Slope Factors In Becquerels

List of Changes in Toxicity Values Summary Table October 1994

**ACRYLIC ACID (79-10-7)**

The Subchronic Oral Rfd is changed from 8.00E-01 to 5.00E-01.

**AROCLOR 1254 (11097-69-1)**

Aroclor 1254 is added to the table. The Chronic Oral Rfd is 2.00E-05.  
The Subchronic Oral Rfd is 5.00E-05.

**BENZ[A]ANTHRACENE (56-55-3)**

Benz[a]anthracene is added to the table. No numerical values are listed, but  
an EPA Cancer Classification of B2 is given.

**BIS(2-CHLOROISOPROPYL)ETHER (39638-32-9)**

Oral and Inhalation Slope Factors are withdrawn. Oral and Inhalation Unit  
Risks are withdrawn. The EPA Cancer Classification is withdrawn.

**BIS(2-CHLORO-1-METHYLETHYL)ETHER (TECHNICAL) (108-06-1)**

Bis(2-chloro-1-methylethyl)ether (technical) is added to the table. The Oral  
Slope Factor is 7.00E-02. The Inhalation Slope Factor is 3.50E-02. The Oral  
Unit Risk is 2.00E-06. The Inhalation Unit Risk is 1.00E-05. The EPA Cancer  
Classification is C.

**CHLOROBENZILATE (510-15-6)**

The EPA Cancer Classification of B2 is added.

**CYANAZINE (21725-46-2)**

The EPA Cancer Classification of C is added.

**DACTHAL (1861-32-1)**

The Chronic Oral Rfd is changed from 5.00E-01 to 1.00E-02.

**DIBROMOETHANE, 1,2- (106-93-4)**

The Subchronic Inhalation Rfc is changed from 8.00E-04 to 2.00E-03.

**DIBROMOMETHANE (74-95-3)**

The EPA Cancer Classification is withdrawn.

**DIFLUOROETHANE, 1,1- (75-37-6)**

Difluoroethane, 1,1- is added to the table. The only value given is the  
Chronic Inhalation Rfc of 4.00E+01.

**DIMETHYLPHthalATE (131-11-3)**

Chronic and Subchronic Oral Rfds are withdrawn.

**DIRECT SKY BLUE (2610-05-1)**

Direct sky blue is added to the table. No numerical values are listed,  
the EPA Cancer Classification of B2 is given.

**ENDOSULFAN (115-29-7)**

The footnote on the Chronic Oral Rfd is changed from b to a, indicating this value comes from IRIS.

**FENPROPATHRIN (39515-41-8)**

The Chronic Oral Rfd is changed from 5.00E-04 to 2.50E-02.

**HEXAMETHYLENE DIISOCYANATE, 1,6- (822-06-0)**

Hexamethylene Diisocyanate, 1,6- is added to the table. The only value given is the Chronic Inhalation Rfc of 1.00E-05.

**HYDROGEN CYANIDE (74-90-8)**

The Chronic Inhalation Rfc of 3.00E-03 is added.

**NIAGARA BLUE 4B (2429-74-5)**

Niagara blue 4B is added to the table. No numerical values are given, the EPA Cancer Classification of B2 is listed.

**NITRIC OXIDE (10102-43-9)**

The Chronic Oral Rfd is withdrawn.

**NITROGEN DIOXIDE (10102-44-0)**

The Chronic Oral Rfd is withdrawn.

**PROPAZINE (139-40-2)**

The EPA Cancer Classification is withdrawn.

**STYRENE (100-42-5)**

The EPA Cancer Classification is withdrawn.

**TETRACHLOROETHYLENE (127-18-4)**

The EPA Cancer Classification is withdrawn.

**TRICHLOROETHYLENE (79-01-6)**

Message to contact the Superfund Health Risk Technical Support Center is footnoted to the EPA Cancer Classification.

All EPA Cancer Classifications are footnoted to indicate source.

# **SECTION ONE**

## **CHEMICAL COMPOUNDS FOUND IN IRIS AND HEAST**

**OCTOBER 1994**

Chemical compounds may be called by any of a large number of acceptable chemical names, common names, or other synonyms, many of which may apply to more than one compound. In order to assist in the identification of chemical compounds, the Chemical Abstracts Service assigns a number to unique chemical formulae. The Chemical Compound tables, listed in both Chemical Abstracts Service Registry Number order and alphabetically in Name order will assist in the identification of a particular chemical.

**CHEMICAL COMPOUNDS FOUND IN IRIS AND HEAST  
IN CHEMICAL ORDER**

## CHEMICAL COMPOUNDS FOUND IN IRIS AND HEAST IN CHEMICAL ORDER

CHEMICAL	CAS NUMBER	CHEMICAL	CAS NUMBER	CHEMICAL	CAS NUMBER
ACENAPHTHENE	000083-32-9	ATRAZINE	001912-24-9	BROMOXYNIL	001689-84-5
ACEPHATE	030560-19-1	AVERMECTIN B1	065195-55-3	BROMOXYNIL OCTANOATE	001689-99-2
ACETALDEHYDE	000075-07-0	AZOBENZENE	000103-33-3	BUTADIENE, 1,3-	000106-99-0
ACETOCHLOR	034256-82-1	BARIUM	007440-39-3	BUTANOL, N-	000071-36-3
ACETONE	000067-64-1	BARIUM CYANIDE	000542-62-1	BUTYL BENZYL PHTHALATE	000085-68-7
ACETONE CYANOHYDRIN	000075-86-5	BAYGON	000114-26-1	BUTYLATE	002008-41-5
ACETONITRILE	000075-05-8	BAYLETON	043121-43-3	BUTYLCHLORIDE, T-	000507-20-0
ACETOPHENONE	000098-86-2	BAYTHROID	068359-37-5	BUTYLPHthalyl BUTYLGLYCOLATE	000085-70-1
ACROLEIN	000107-02-8	BENEFIN	001861-40-1	CACODYLIC ACID	000075-60-5
ACRYLAMIDE	000079-06-1	BENOMYL	017804-35-2	CADMIUM (Diet)	007440-43-9
ACRYLIC ACID	000079-10-7	BENTAZON	025057-89-0	CADMIUM (Water)	007440-43-9
ACRYLONITRILE	000107-13-1	BENZALDEHYDE	000100-52-7	CALCIUM CYANIDE	000592-01-8
ALACHLOR	015972-60-8	BENZENE	000071-43-2	CAPROLACTAM	000105-60-2
ALAR	001596-84-5	BENZENETHIOL	000108-98-5	CAPTAFOL	002425-06-1
ALDICARB	000116-06-3	BENZIDINE	000092-87-5	CAPTAN	000133-06-2
ALDICARB SULFONE	001646-88-4	BENZOIC ACID	000065-85-0	CARBARYL	000063-25-2
ALDRIN	000309-00-2	BENZOTRICHLORIDE	000098-07-7	CARBAZOLE	000086-74-8
ALLY	074223-64-6	BENZO[AI]PYRENE	000050-32-8	CARBOFURAN	001563-86-2
ALLYL ALCOHOL	000107-18-6	BENZO[B]FLUORANTHENE	000205-99-2	CARBON DISULFIDE	000075-15-0
ALLYL CHLORIDE	000107-05-1	BENZO[G,H,I]PERYLENE	000191-24-2	CARBON TETRACHLORIDE	000056-23-5
ALUMINUM PHOSPHIDE	020659-73-8	BENZO[K]FLUORANTHENE	000207-08-9	CARBOSULFAN	055285-14-8
AMDRO	067485-29-4	BENZYL ALCOHOL	000100-51-8	CARBOXIN	005234-68-4
AMETRYN	000634-12-8	BENZYL CHLORIDE	000100-44-7	CHLORAL	000075-87-8
AMINOPHENOL, m-	000591-27-6	BENZ[A]ANTHRACENE	000056-55-3	CHLORAMBEN	000133-90-4
AMINOPYRIDINE, 4-	000504-24-5	BERYLLIUM	007440-41-7	CHLORANIL	000118-75-2
AMITRAZ	033089-61-1	BIDRIN	000141-68-2	CHLORDANE	000057-74-9
AMMONIA	007664-41-7	BIPHENTHRIN	082657-04-3	CHLORIMURON-ETHYL	090982-32-4
AMMONIUM SULFAMATE	007773-06-0	BIPHENYL, 1,1'-	000092-52-4	CHLORINE	007782-50-5
ANILINE	000062-53-3	BIS(2-CHLORO-1-METHYLETHYL)ETHER (TECHNICAL)	000108-08-1	CHLORINE DIOXIDE	010049-04-4
ANTHRAHCENE	000120-12-7	BIS(2-CHLOROETHOXY)METHANE	000111-91-1	CHLORO-1,3-BUTADIENE, 2-	000126-99-8
ANTIMONY (METALLIC)	007440-36-0	BIS(2-CHLOROETHYL)ETHER	000111-44-4	CHLORO-2-METHYLANILINE HCl, 4-	003165-83-3
ANTIMONY PENTOXIDE	001314-60-9	BIS(2-CHLOROISOPROPYL)ETHER	039638-32-9	CHLORO-2-METHYLANILINE, 4-	000095-69-2
ANTIMONY POTASSIUM TARTRATE	000304-61-0	BIS(2-ETHYLHEXYL)PHTHALATE	000117-81-7	CHLOROACETIC ACID	000079-11-8
ANTIMONY TETROXIDE	001332-81-8	BIS(CHLOROMETHYL)ETHER	000542-88-1	CHLOROACETOPHENONE, 2-	000532-27-4
ANTIMONY TRIOXIDE	001309-64-4	BISPHENOL A	000080-05-7	CHLOROANILINE, p-	000106-47-8
APOLLO	074115-24-5	BORON TRIFLUORIDE	007637-07-2	CHLOROBENZENE	000108-90-7
ARAMITE	000140-57-8	BORON and BORATES ONLY	007440-42-8	CHLOROBENZILATE	000510-15-6
AROCLOR 1016	012674-11-2	BROMOCHLOROMETHANE	000074-97-5	CHLOROBENZOIC ACID, p-	000074-11-3
AROCLOR 1254	011097-69-1	BROMODICHLOROMETHANE	000075-27-4	CHLOROBENZOTRIFLUORIDE, 4-	000098-56-6
ARSENIC, INORGANIC	007440-38-2	BROMODIPHENYL ETHER, p-	000101-55-3	CHLOROBUTANE, 1-	000109-69-3
ARSINE	007784-42-1	BROMOFORM	000075-25-2	CHLOROBUTANE, 2-	000078-86-4
ASBESTOS	001332-21-4	BROMOMETHANE	000074-83-9	CHLOROCYCLOPENTADIENE	041851-50-7
ASSURE	076578-14-8	BROMOPHOS	002104-96-3	CHLORODIBROMOETHANE	073506-94-2
ASULAM	003337-71-1	BROMOTRICHLOROMETHANE	000075-62-7	CHLORODIFLUOROMETHANE	000075-45-6

## CHEMICAL COMPOUNDS FOUND IN IRIS AND HEAST IN CHEMICAL ORDER

CHEMICAL	CAS NUMBER	CHEMICAL	CAS NUMBER	CHEMICAL	CAS NUMBER
CHLOROFORM	000067-68-3	DDE	000072-55-9	DIETHYLFORMAMIDE	000617-84-5
CHLOROMETHANE	000074-87-3	DDT	000050-29-3	DIETHYLSTILBESTEROL	000056-53-1
CHLOROMETHYL METHYL ETHER	000107-30-2	DECABROMODIPHENYL ETHER	001163-19-5	DIFENOQUAT	043222-48-8
CHLORONAPHTHALENE, BETA-	000091-58-7	DEMETON	008065-48-3	DIFLUBENZURON	035367-38-5
CHLORONITROBENZENE, o-	000088-73-3	DI(2-ETHYLHEXYL)ADIPATE	000103-23-1	DIFLUOROETHANE, 1,1-	000075-37-6
CHLORONITROBENZENE, p-	000121-73-3	DIALLATE	002303-16-4	DIISOPROPYL METHYLPHOSPHONATE	001445-75-8
CHLOROPHENOL, 2-	000095-57-8	DIAZINON	000333-41-5	DIMETHIPIN	055290-64-7
CHLOROPHENYL METHYL SULFIDE, p-	000123-09-1	DIBENZ[A,H]ANTHRACENE	000053-70-3	DIMETHOATE	000060-51-5
CHLOROPHENYL METHYL SULFOXIDE	000934-73-6	DIBROMO-3-CHLOROPROPANE, 1,2-	000098-12-8	DIMETHOXYBENZIDINE, 3,3'-	000119-90-4
CHLOROPROPANE, 2-	000075-29-6	DIBROMOBENZENE, 1,4-	000106-37-8	DIMETHYL SULFATE	000077-78-1
CHLOROTHALONIL	001897-45-6	DIBROMOCHLOROMETHANE	000124-48-1	DIMETHYLANILINE HCL, 2,4-	021436-96-4
CHLOROTOLUENE, o-	000095-49-8	DIBROMODICHLOROMETHANE	000594-18-3	DIMETHYLANILINE, 2,4-	000095-68-1
CHLORPROPHAM	000101-21-3	DIBROMODIPHENYL ETHER, p,p'	002050-47-7	DIMETHYLANILINE, N,N-	000121-69-7
CHLORPYRIFOS	002921-88-2	DIBROMOETHANE, 1,2-	000108-93-4	DIMETHYLBENZIDINE, 3,3'-	000119-93-7
CHLORPYRIFOS METHYL	005598-13-0	DIBROMOMETHANE (METHYLENE BROMIDE)	000074-95-3	DIMETHYLETHYL LEAD	107584-40-7
CHLORSULFURON	064902-72-3	DIBUTYL PHTHALATE	000084-74-2	DIMETHYLFORMAMIDE	000068-12-2
CHLORTIOPHOS	060238-58-4	DICAMBA	001918-00-9	DIMETHYLHYDRAZINE, 1,2-	000540-73-8
CHROMIUM (II) (INSOLUBLE SALTS)	016005-83-1	DICHLORO-2-BUTENE, 1,4-	000784-41-0	DIMETHYLPHENOL, 2,4-	000105-67-9
CHROMIUM (VI)	018540-29-9	DICHLOROBENZENE, 1,2-	000095-50-1	DIMETHYLPHENOL, 2,6-	000576-28-1
CHRYSENE	000218-01-9	DICHLOROBENZENE, 1,3-	000541-73-1	DIMETHYLPHENOL, 3,4-	000095-65-8
COKE OVEN EMISSIONS	008007-45-2	DICHLOROBENZENE, 1,4-	000106-46-7	DIMETHYLPHthalate	000131-11-3
COPPER	007440-50-8	DICHLOROBENZIDINE, 3,3'-	000091-94-1	DIMETHYLTEREPHTHALATE	000120-81-8
COPPER CYANIDE	000544-82-3	DICHLORODIFLUOROMETHANE	000075-71-8	DINITRO-O-CYCLOHEXYL PHENOL, 4,6-	000131-89-5
CREOSOTE	008001-58-8	DICHLOROETHANE, 1,1-	000075-34-3	DINITROBENZENE, 1,2-	000528-29-0
CRESOL, m-	000108-39-4	DICHLOROETHANE, 1,2-	000107-06-2	DINITROBENZENE, 1,3-	000099-65-0
CRESOL, o-	000095-48-7	DICHLOROETHYLENE, 1,1-	000075-35-4	DINITROBENZENE, 1,4-	000100-25-4
CRESOL, p-	000106-44-5	DICHLOROETHYLENE, 1,2-, (MIXED ISOMERS)	000540-59-0	DINITROPHENOL, 2,4-	000051-28-5
CROTONALDEHYDE	000123-73-9	DICHLOROETHYLENE, 1,2-C-	000156-59-2	DINITROTOLUENE, 2,4-	000121-14-2
CUMENE	000098-82-8	DICHLOROETHYLENE, 1,2-T-	000156-60-5	DINITROTOLUENE, 2,6-	000606-20-2
CYANAZINE	021725-48-2	DICHLOROPHENOL, 2,4-	000120-83-2	DINOSEB	000088-85-7
CYANIDE (CN-)	000057-12-5	DICHLOROPHOXY ACETIC ACID, 2,4-	000094-75-7	DIOXANE, 1,4-	000123-91-1
CYANOGEN	000460-19-5	DICHLOROPHOXYBUTYRIC ACID, 4-(2,4-	000094-82-8	DIPHENAMID	000957-51-7
CYANOGEN BROMIDE	000506-68-3	DICHLOROPROPANE, 1,2-	000078-87-5	DIPHENYLAMINE	000122-39-4
CYANOGEN CHLORIDE	000506-77-4	DICHLOROPROPANOL, 2,3-	000616-23-9	DIPHENYLHYDRAZINE, 1,2-	000122-66-7
CYCLOHEXANE, 1,2,3,4,5-PENTABROMO-6-CHLORO	000087-84-3	DICHLOROPROPENE, 1,3-	000542-75-8	DIQUAT	000085-00-7
CYCLOHEXANONE	000108-94-1	DICHLOROVOS	000062-73-7	DIRECT BLACK 38	001937-37-7
CYCLOHEXYLAMINE	000108-91-8	DICOFOL	000115-32-2	DIRECT BLUE 6	002602-46-2
CYCLOPENTADIENE	000542-92-7	DICYCLOPENTADIENE	000077-73-8	DIRECT BROWN 95	016071-86-6
CYHALOTHrin/KARATE	068085-85-8	DIELDRIN	000060-57-1	DIRECT SKY BLUE	002810-05-1
CYPERMETHrin	052315-07-8	DIETHYL PHTHALATE	000084-66-2	DISULFOTON	000298-04-4
CYROMAZINE	066215-27-8	DIETHYL-P-NITROPHENYLPHOSPHATE	000311-45-5	DIURON	000330-54-1
DACTHAL	001861-32-1	DIETHYLENE GLYCOL DINITRATE (DEGDN)	000693-21-0	DODINE	002439-10-3
DALAPON	000075-99-0	DIETHYLENE GLYCOL MONOBUTYL ETHER	000112-34-5	ENDOSULFAN	000115-29-7
DDD	000072-54-8	DIETHYLENE GLYCOL MONOETHYL ETHER	000111-90-0	ENDOTHALL	000145-73-3

## CHEMICAL COMPOUNDS FOUND IN IRIS AND HEAST IN CHEMICAL ORDER

CHEMICAL	CAS NUMBER	CHEMICAL	CAS NUMBER	CHEMICAL	CAS NUMBER
ENDRIN	000072-20-8	GLUFOSINATE-AMMONIUM	077182-82-2	LEAD ALKYLS	NA
EPICHLOROHYDRIN	000106-89-8	GLYCIDYL	000765-34-4	LEAD AND COMPOUNDS	007439-92-1
EPOXYBUTANE, 1,2-	000106-88-7	GLYPHOSATE	001071-83-6	LINURON	000330-55-2
ERTC	000759-94-4	GOAL	042874-03-3	LONDAX	083055-99-8
ETHEPHON	016672-87-0	HALOXYFOP-METHYL	069806-40-2	MALATHION	000121-75-5
ETHION	000563-12-2	HARMONY	079277-27-3	MALEIC ANHYDRIDE	000108-31-8
ETHOXYETHANOL ACETATE, 2-	000111-15-9	HEPTACHLOR	000076-44-8	MALEIC HYDRAZIDE	000123-33-1
ETHOXYETHANOL, 2-	000110-80-5	HEPTACHLOR EPOXIDE	001024-57-3	MALONONITRILE	000109-77-3
ETHYL ACETATE	000141-78-6	HEPTANE, N-	000142-82-5	MANCOZEB	008018-01-7
ETHYL ACRYLATE	000140-88-5	HEXAABROMOBENZENE	000087-82-1	MANEB	012427-38-2
ETHYL CHLORIDE	000075-00-3	HEXAChLOROBENZENE	000118-74-1	MANGANESE (Diet)	007439-98-5
ETHYL ETHER	000060-29-7	HEXAChLOROBUTADIENE	000087-68-3	MANGANESE (Water)	007439-98-5
ETHYL METHACRYLATE	000097-63-2	HEXAChLOROCYCLOHEXANE, ALPHA-	000319-84-8	MCPA	000094-74-8
ETHYL-p-NITROPHENYL PHOSPHONATE	002104-64-5	HEXAChLOROCYCLOHEXANE, BETA-	000319-85-7	MCPB	000094-81-5
ETHYLBENZENE	000100-41-4	HEXAChLOROCYCLOHEXANE, DELTA-	000319-86-8	MCPP	000093-85-2
ETHYLENE CYANOHYDRIN	000108-78-4	HEXAChLOROCYCLOHEXANE, EPSILON	006108-10-7	MEPHOSFOLAN	000950-10-7
ETHYLENE DIAMINE	000107-15-3	HEXAChLOROCYCLOHEXANE, GAMMA-	000058-89-9	MEPIQUAT CHLORIDE	024307-28-4
ETHYLENE GLYCOL	000107-21-1	HEXAChLOROCYCLOHEXANE, TECHNICAL	000608-73-1	MERCURY, INORGANIC	007439-97-8
ETHYLENE GLYCOL MONOBUTYL ETHER	000111-78-2	HEXAChLOROCYCLOPENTADIENE	000077-47-4	MERPHOS	000150-50-5
ETHYLENE OXIDE	000075-21-8	HEXAChLORODIBENZO-p-DIOXIN, MIXTURE	019408-74-3	MERPHOS OXIDE	000078-48-8
ETHYLENE THIOUREA	000098-45-7	HEXAChLOROETHANE	000087-72-1	METALAXYL	057837-19-1
ETHYLPHthalyl ETHYL GLYCOLATE	000084-72-0	HEXAChLOROPHENENE	000070-30-4	METHACRYLONITRILE	000128-98-7
EXPRESS	101200-48-0	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE (RDX)	000121-82-4	METHAMIDOPHOS	010265-92-8
PENAMIPHOS	022224-92-6	HEXAMETHYLENE DIISOCYANATE, 1,6-	000822-06-0	METHANOL	000087-56-1
FENPROPOTHIRIN	039515-41-8	HEXANE, N-	000110-54-3	METHIDATHION	000950-37-8
FLUOMETURON	002164-17-2	HEXAZINONE	051235-04-2	METHOMYL	016752-77-8
FLUORANTHENE	000206-44-0	HYDRAZINE	000302-01-2	METHOXY-5-NITROANILINE, 2-	000099-59-2
FLUORENE	000088-73-7	HYDRAZINE SULFATE	010034-93-2	METHOXYCHLOR	000072-43-6
FLUORIDE	007782-41-4	HYDROGEN CHLORIDE	007647-01-0	METHOXYETHANOL ACETATE, 2-	000110-49-8
FLURIDONE	059756-60-4	HYDROGEN CYANIDE	000074-90-8	METHOXYETHANOL, 2-	000109-88-4
FLURPRIMIDOL	056425-81-3	HYDROGEN SULFIDE	007783-06-4	METHYL ACETATE	000079-20-9
FLUTOLANIL	066332-96-5	HYDROQUINONE	000123-31-9	METHYL ACRYLATE	000096-33-3
FLUVALINATE	069409-94-5	IMAZALIL	035554-44-0	METHYL ETHYL KETONE	000078-93-3
FOLPET	000133-07-3	IMAZAQUIN	081335-37-7	METHYL ISOBUTYL KETONE	000108-10-1
FOMESAFEN	072178-02-0	INDENO[1,2,3- <i>cd</i> ]PYRENE	000193-39-5	METHYL MERCURY	022967-92-8
FONOFOSS	000844-22-9	IPRODIONE	036734-19-7	METHYL METHACRYLATE	000080-62-6
FORMALDEHYDE	000050-00-0	ISOBUTYL ALCOHOL	000078-83-1	METHYL PARATHION	000298-00-0
FORMIC ACID	000064-18-6	ISOPHORONE	000078-59-1	METHYL STYRENE (MIXED ISOMERS)	025013-15-4
FOSETYL-AL	039148-24-8	ISOPROPALIN	033820-53-0	METHYL TERT-BUTYL ETHER (MTBE)	001634-04-4
FURAN	000110-00-9	ISOPROPYL METHYL PHOSPHONIC ACID	001832-54-8	METHYL-5-NITROANILINE, 2-	000099-55-8
FURAZOLIDONE	000067-45-8	ISOXABEN	082558-50-7	METHYLANILINE HYDROCHLORIDE, 2-	000636-21-5
FURFURAL	000098-01-1	KARATE	091465-08-8	METHYLCYCLOHEXANE	000108-87-2
FURUM	000531-82-8	KERB	023950-58-5	METHYLENE CHLORIDE	000075-09-2
FURMECYCLOX	060568-05-0	LACTOFEN	077501-63-4	METHYLENE-BIS(2-CHLOROANILINE), 4,4-	000101-14-4

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CHEMICAL	CAS NUMBER	CHEMICAL	CAS NUMBER	CHEMICAL	CAS NUMBER
METHYLENE-BIS(N,N-DIMETHYL) ANILINE, 4,4'-	000101-61-1	NITROTOLUENE, p-	000099-99-0	PROPACHLOR	001918-16-7
METHYLENEBISBENZENAMINE, 4,4'-	000101-77-9	NORFLURAZON	027314-13-2	PROPANIL	000709-98-8
METHYLENEDIPHENYL ISOCYANATE, 4,4'-	000101-68-8	NUSTAR	085509-19-9	PROPARGITE	002312-35-8
METHYLSTYRENE, ALPHA-	000098-83-9	OCTABROMODIPHENYL ETHER	032536-52-0	PROPARGYL ALCOHOL	000107-19-7
METHYLTRIETHYL LEAD	001762-28-3	OCTAHYDRO-1,3,5,7-TETRANITRO-1,3,5,7-TETRA (HMX)	002691-41-0	PROPAZINE	000139-40-2
METOLACHLOR	051218-45-2	OCTAMETHYL PYROPHOSPHORAMIDE	000152-16-8	PROPHAM	000122-42-8
METRIBUZIN	021087-64-9	OCTYL PHTHALATE, DI-N-	000117-84-0	PROPICONAZOLE	060207-90-1
MIREX	002385-85-5	ORYZALIN	019044-88-3	PROPYLENE GLYCOL	000057-55-8
MOLINATE	002212-67-1	OXADIAZON	019666-30-9	PROPYLENE GLYCOL MONOETHYL ETHER	001569-02-4
MOLYBDENUM	007439-98-7	OXAMYL	023135-22-0	PROPYLENE GLYCOL MONOMETHYL ETHER	000107-98-2
MONOCHLORAMINE	010599-90-3	PACLOBUTRAZOL	076738-62-0	PROPYLENE OXIDE	000075-56-8
MONOCHLOROBUTANES	025154-42-1	PARAQUAT	001910-42-5	PURSUIT	081335-77-5
NALED	000300-76-5	PARATHION	000056-38-2	PYDRIN	051630-58-1
NAPHTHALENE	000091-20-3	PEBULATE	001114-71-2	PYRENE	000129-00-0
NAPROPAMIDE	015299-99-7	PENDIMETHALIN	040487-42-1	PYRIDINE	000110-96-1
NIAGARA BLUE 4B	002429-74-5	PENTABROMODIPHENYL ETHER	032534-81-9	QUINALPHOS	013593-03-8
NICKEL CARBONYL	013463-39-3	PENTACHLOROBENZENE	000608-93-5	QUINOLINE	000091-22-5
NICKEL REFINERY DUST	NA	PENTACHLOROCYCLOPENTADIENE	025328-35-5	RALLY	088671-89-0
NICKEL SOLUBLE SALTS	007440-02-0	PENTACHLORONITROBENZENE	000082-68-8	REFRACTORY CERAMIC FIBERS	NA
NICKEL SUBSULFIDE	012035-72-2	PENTACHLOROPHENOL	000087-86-5	RESMETHRIN	010453-88-8
NITRAPYRIN	001929-82-4	PERMETHRIN	052645-53-1	RONNEL	000299-84-3
NITRATE	014797-55-8	PHENANTHRENE	000085-01-8	ROtenone	000083-79-4
NITRIC OXIDE	010102-43-9	PHENMEDIPHAM	013684-63-4	SAVEY	078587-05-0
NITRITE	014797-65-0	PHENOL	000108-95-2	SELENIUS ACID	007783-00-8
NITROANILINE, 2-	000088-74-4	PHENYLENEDIAMINE, m-	000108-45-2	SELENIUM	007782-49-2
NITROBENZENE	000098-95-3	PHENYLENEDIAMINE, o-	000095-54-5	SELENIUM SULFIDE	007446-34-8
NITROFURANTOIN	000067-20-9	PHENYLENEDIAMINE, p-	000106-50-3	SELENOUREA	000630-10-4
NITROFURAZONE	000059-87-0	PHENYLMERCURIC ACETATE	000062-38-4	SETHOXYDIM	074051-80-2
NITROGEN DIOXIDE	010102-44-0	PHENYLPHENOL, 2-	000090-43-7	SILVER	007440-22-4
NITROGUANIDINE	000556-88-7	PHORATE	000298-02-2	SILVER CYANIDE	000508-64-9
NITROPROPANE, 2-	000079-46-8	PHOSMET	000732-11-6	SIMAZINE	000122-34-8
NITROSO-DI-N-BUTYLAMINE, N-	000924-16-3	PHOSPHINE	007803-51-2	SODIUM ACIFLUORFEN	082476-59-8
NITROSO-DI-N-PROPYLAMINE, N-	000621-64-7	PHTHALIC ACID, p-	000100-21-0	SODIUM AZIDE	026628-22-8
NITROSO-N-ETHYLUREA, N-	000759-73-9	PHTHALIC ANHYDRIDE	000085-44-9	SODIUM CYANIDE	000143-33-9
NITROSO-N-METHYLUREA, N-	000684-93-5	PICLORAM	001918-02-1	SODIUM DIETHYLDITHIOTCARBAMATE	000148-18-5
NITROSODIETHANOLAMINE, N-	001116-54-7	PIRIMPHOS-METHYL	029232-93-7	SODIUM FLUOROACETATE	000062-74-8
NITROSODIETHYLAMINE, N-	000055-18-5	POLYBROMINATED BIPHENYLS	NA	SODIUM METAVANADATE	013718-28-8
NITROSODIMETHYLAMINE, N-	000062-75-8	POLYCHLORINATED BIPHENYLS	001336-36-3	STIROFOS (TETRACHLOROVINPHOS)	000961-11-5
NITROSODIPHENYLAMINE, N-	000086-30-6	POTASSIUM CYANIDE	000151-50-8	STRONTIUM, STABLE	007440-24-8
NITROSOMETHYLETHYLAMINE, N-	010595-95-6	POTASSIUM SILVER CYANIDE	000506-61-6	STRYCHNINE	000057-24-9
NITROSOMETHYLVINYLMINE, N-	004549-40-0	PROCHLORAZ	067747-09-5	STYRENE	000100-42-5
NITROSOPIRROLIDINE, N-	000930-55-2	PROFLURALIN	026399-36-0	TCDD, 2,3,7,8-	001746-01-6
NITROTOLUENE, m-	000099-08-1	PROMETON	001610-18-0	TCMTB	021564-17-0
NITROTOLUENE, o-	000088-72-2	PROMETRYN	007287-19-6	TEBUTHIURON	034014-18-1

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CHEMICAL	CAS NUMBER	CHEMICAL	CAS NUMBER	CHEMICAL	CAS NUMBER
TEMEPHOS	003383-96-8	TRICHLOROANILINE HCL, 2,4,6-	033663-50-2	ZINC CYANIDE	000557-21-1
TERBACIL	005902-51-2	TRICHLOROANILINE, 2,4-	000634-93-5	ZINC PHOSPHIDE	001314-84-7
TERBUFOS	013071-79-9	TRICHLOROBENZENE, 1,2,4-	000120-82-1	ZINEB	012122-87-7
TERBUTRYN	000886-50-0	TRICHLOROETHANE, 1,1,1-	000071-55-6		
TETRABUTYL LEAD	001920-90-7	TRICHLOROETHANE, 1,1,2-	000079-00-5		
TETRACHLOROBENZENE, 1,2,4,5-	000095-94-3	TRICHLOROETHYLENE	000079-01-8		
TETRACHLOROETHANE, 1,1,1,2-	000630-20-6	TRICHLOROFLUOROMETHANE	000075-69-4		
TETRACHLOROETHANE, 1,1,2,2-	000079-34-5	TRICHLOROPHENOL, 2,4,5-	000095-95-4		
TETRACHLOROETHYLENE	000127-18-4	TRICHLOROPHENOL, 2,4,6-	000088-06-2		
TETRACHLOROPHENOL, 2,3,4,6-	000058-90-2	TRICHLOROPHOXY) PROPIONIC ACID, 2(2,4,5-	000093-72-1		
TETRACHLOROTOLUENE, p- ALPHA, ALPHA, ALPHA-	005216-25-1	TRICHLOROPHOXYACETIC ACID, 2,4,5-	000093-76-5		
TETRAETHYL DITHIOPYROPHOSPHATE	003689-24-5	TRICHLOROPROPANE, 1,1,2-	000598-77-6		
TETRAETHYL LEAD	000078-00-2	TRICHLOROPROPANE, 1,2,3-	000096-18-4		
TETRAMETHYL LEAD	000075-74-1	TRICHLOROPROPENE, 1,2,3-	000096-19-5		
TETRAPROPYL LEAD	003440-75-3	TRICHLOROTOLUENE, 2,3,6-	002077-46-5		
THALLIC OXIDE	001314-32-6	TRICHLOROTOLUENE, ALPHA 2,6-	002014-83-7		
THALLIUM (I) NITRATE	010102-45-1	TRIDIPHANE	058138-08-2		
THALLIUM (SOLUBLE SALTS)	NA	TRIETHYL LEAD	005224-23-7		
THALLIUM ACETATE	000563-68-8	TRIETHYLAMINE	000121-44-8		
THALLIUM CARBONATE	008533-73-9	TRIFLURALIN	001582-09-8		
THALLIUM CHLORIDE	007791-12-0	TRIMETHYL LEAD	007442-13-9		
THALLIUM Selenite	012039-52-0	TRIMETHYL PHOSPHATE	000512-58-1		
THALLIUM SULFATE	007448-18-6	TRIMETHYLETHYL LEAD	001762-26-1		
THIOBENCARB	028249-77-6	TRINITROBENZENE, 1,3,5-	000099-35-4		
THIOFANOX	039196-18-4	TRINITROPHENYLMETHYLNITRAMINE	000479-45-8		
THIOPHANATE-METHYL	023564-05-8	TRINITROTOLUENE, 2,4,6-	000118-98-7		
THIRAM	000137-26-8	TRIPROPYL LEAD	006618-03-7		
TIN	007440-31-5	URANIUM (SOLUBLE SALTS)	NA		
TOLUENE	000108-88-3	VANADIUM PENTOXIDE	001314-62-1		
TOLUENE-2,4-DIAMINE	000095-80-7	VANADIUM SULFATE	036907-42-3		
TOLUENE-2,5-DIAMINE	000095-70-5	VANADIUM, METALLIC	007440-62-2		
TOLUENE-2,6-DIAMINE	000823-40-5	VANADYL SULFATE	027774-13-6		
TOLUIDINE, o- (METHYLANILINE, 2-)	000095-53-4	VERNOLATE	001929-77-7		
TOLUIDINE, p-	000106-49-0	VINCLOZOLIN	050471-44-8		
TOXAPHENE	008001-35-2	VINYL ACETATE	000108-05-4		
TRALOMETHRIN	066841-25-6	VINYL BROMIDE	000593-60-2		
TRIALLATE	002303-17-5	VINYL CHLORIDE	000075-01-4		
TRIASULFURON	082097-50-5	WARFARIN	000081-81-2		
TRIBROMOBENZENE, 1,2,4-	000615-54-3	WHITE PHOSPHORUS	007723-14-0		
TRIBROMOCHLOROMETHANE	000594-15-0	XYLENE, MIXTURE	001330-20-7		
TRIBROMODIPHENYL ETHER	049690-94-0	XYLENE, m-	000108-38-3		
TRIBUTYLTIN OXIDE	000056-35-9	XYLENE, o-	000095-47-6		
TRICHLORO-1,2,2-TRIFLUOROETHANE, 1,1,2-	000076-13-1	XYLENE, p-	000106-42-3		
TRICHLORO-2-HYDROXYDIPHENYLETHER	003380-34-5	ZINC (METALLIC)	007440-66-6		

**CHEMICAL COMPOUNDS FOUND IN IRIS AND HEAST  
IN CAS NUMBER ORDER**

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CAS NUMBER	CHEMICAL	CAS NUMBER	CHEMICAL	CAS NUMBER	CHEMICAL
000050-00-0	FORMALDEHYDE	000074-11-3	CHLOROBENZOIC ACID, p-	000079-10-7	ACRYLIC ACID
000050-29-3	DDT	000074-83-9	BROMOMETHANE	000079-11-8	CHLOROACETIC ACID
000050-32-8	BENZO[A]PYRENE	000074-87-3	CHLOROMETHANE	000079-20-9	METHYL ACETATE
000051-28-5	DINITROPHENOL, 2,4-	000074-90-8	HYDROGEN CYANIDE	000079-34-5	TETRACHLOROETHANE, 1,1,2,2-
000053-70-3	DIBENZ[A,H]ANTHRACENE	000074-95-3	DIBROMOMETHANE (METHYLENE BROMIDE)	000079-46-9	NITROPROPANE, 2-
000055-18-5	NITROSODIETHYLAMINE, N-	000074-97-5	BROMOCHLOROMETHANE	000080-05-7	BISPHENOL A
000056-23-5	CARBON TETRACHLORIDE	000075-00-3	ETHYL CHLORIDE	000080-62-6	METHYL METHACRYLATE
000056-35-9	TRIBUTYLTIN OXIDE	000075-01-4	VINYL CHLORIDE	000081-81-2	WARFARIN
000056-38-2	PARATHION	000075-05-8	ACETONITRILE	000082-68-8	PENTACHLORONITROBENZENE
000056-53-1	DIETHYLSTILBESTEROL	000075-07-0	ACETALDEHYDE	000083-32-9	ACENAPHTHENE
000056-55-3	BENZ[A]ANTHRACENE	000075-09-2	METHYLENE CHLORIDE	000083-79-4	ROTENONE
000057-12-5	CYANIDE (CN-)	000075-15-0	CARBON DISULFIDE	000084-66-2	DIETHYL PHTHALATE
000057-24-9	STRYCHNINE	000075-21-8	ETHYLENE OXIDE	000084-72-0	ETHYLPHthalyl ETHYL GLYCOLATE
000057-55-6	PROPYLENE GLYCOL	000075-25-2	BROMOFORM	000084-74-2	DIBUTYL PHTHALATE
000057-74-9	CHLORDANE	000075-27-4	BROMODICHLOROMETHANE	000085-00-7	DIQUAT
000058-89-9	HEXAChLOROCYCLOHEXANE, GAMMA-	000075-29-6	CHLOROPROPANE, 2-	000085-01-8	PHENANTHRENE
000058-80-2	TETRACHLOROPHENOL, 2,3,4,6-	000075-34-3	DICHLOROETHANE, 1,1-	000085-44-9	PHTHALIC ANHYDRIDE
000059-87-0	NITROFURAZONE	000075-35-4	DICHLOROETHYLENE, 1,1-	000085-68-7	BUTYL BENZYL PHTHALATE
000060-29-7	ETHYL ETHER	000075-37-6	DIFLUOROETHANE, 1,1-	000085-70-1	BUTYLPHthalyl BUTYLGLYCOLATE
000060-51-5	DIMETHOATE	000075-45-6	CHLORODIFLUOROMETHANE	000086-30-6	NITROSODIPHENYLAMINE, N-
000060-57-1	DIELDRIN	000075-56-9	PROPYLENE OXIDE	000086-73-7	FLUORENE
000062-38-4	PHENYL MERCURIC ACETATE	000075-60-5	CACODYLIC ACID	000086-74-8	CARBAZOLE
000062-53-3	ANILINE	000075-62-7	BROMOTRICHLOROMETHANE	000087-68-3	HEXAChLOROBUTADIENE
000062-73-7	DICHLORVOS	000075-69-4	TRICHLOROFLUOROMETHANE	000087-82-1	HEXBROMOBENZENE
000062-74-8	SODIUM FLUOROACETATE	000075-71-8	DICHLORODIFLUOROMETHANE	000087-84-3	CYCLOHEXANE, 1,2,3,4,5-PENTABROMO-6-CHLORO
000062-75-9	NITROSODIMETHYLAMINE, N-	000075-74-1	TETRAMETHYL LEAD	000087-86-5	PENTACHLOROPHENOL
000063-25-2	CARBARYL	000075-86-5	ACETONE CYANOHYDRIN	000088-06-2	TRICHLOROPHENOL, 2,4,6-
000064-18-6	FORMIC ACID	000075-87-6	CHLORAL	000088-72-2	NITROTOLUENE, o-
000065-85-0	BENZOIC ACID	000075-99-0	DALAPON	000088-73-3	CHLORONITROBENZENE, o-
000067-20-9	NITROFURANTOIN	000076-13-1	TRICHLORO-1,2,2-TRIFLUOROETHANE, 1,1,2-	000088-74-4	NITROANILINE, 2-
000067-45-8	FURAZOLIDONE	000076-44-8	HEPTACHLOR	000088-85-7	DINOSEB
000067-56-1	METHANOL	000077-47-4	HEXAChLOROCYCLOPENTADIENE	000090-43-7	PHENYLPHENOL, 2-
000067-64-1	ACETONE	000077-73-6	DICYCLOPENTADIENE	000091-20-3	NAPHTHALENE
000067-86-3	CHLOROFORM	000077-78-1	DIMETHYL SULFATE	000091-22-5	QUINOLINE
000067-72-1	HEXAChLOROETHANE	000078-00-2	TETRAETHYL LEAD	000091-58-7	CHLORONAPHTHALENE, BETA-
000068-12-2	DIMETHYLFORMAMIDE	000078-48-8	MERPHOS OXIDE	000091-94-1	DICHLOROBENZIDINE, 3,3'-
000070-30-4	HEXAChLOROPHENE	000078-59-1	ISOPHORONE	000092-52-4	BIPHENYL, 1,1'-
000071-36-3	BUTANOL, N-	000078-83-1	ISOBUTYL ALCOHOL	000092-87-5	BENZIDINE
000071-43-2	BENZENE	000078-86-4	CHLOROBUTANE, 2-	000093-65-2	MCPP
000071-55-6	TRICHLOROETHANE, 1,1,1-	000078-87-5	DICHLOROPROPANE, 1,2-	000093-72-1	TRICHLOROPHOXY) PROPIONIC ACID, 2(2,4,5-
000072-20-8	ENDRIN	000078-93-3	METHYL ETHYL KETONE	000093-76-5	TRICHLOROPHOXYACETIC ACID, 2,4,5-
000072-43-5	METHOXYCHLOR	000079-00-5	TRICHLOROETHANE, 1,1,2-	000094-74-6	MCPA
000072-54-8	DDD	000079-01-6	TRICHLOROETHYLENE	000094-75-7	DICHLOROPHOXY ACETIC ACID, 2,4-
000072-55-9	DDE	000079-06-1	ACRYLAMIDE	000094-81-5	MCPB

## CHEMICAL COMPOUNDS FOUND IN IRIS AND HEAST IN CAS NUMBER ORDER

CAS NUMBER	CHEMICAL	CAS NUMBER	CHEMICAL	CAS NUMBER	CHEMICAL
000094-82-6	DICHLOROPHOXYBUTYRIC ACID, 4-(2,4-	000101-61-1	METHYLENE-BIS(N,N-DIMETHYL) ANILINE, 4,4'-	000109-78-4	ETHYLENE CYANOHYDRIN
000095-47-6	XYLENE, o-	000101-68-8	METHYLEDIPHENYL ISOCYANATE, 4,4'-	000109-86-4	METHOXYETHANOL, 2-
000095-48-7	CRESOL, o-	000101-77-9	METHYLENEBISBENZENAMINE, 4,4'-	000110-00-9	FURAN
000095-49-8	CHLOROTOLUENE, o-	000103-23-1	DI(2-ETHYLHEXYL)ADIPATE	000110-49-8	METHOXYETHANOL ACETATE, 2-
000095-50-1	DICHLOROBENZENE, 1,2-	000103-33-3	AZOBENZENE	000110-54-3	HEXANE, N-
000095-53-4	TOLUIDINE, o- (METHYLANILINE, 2-)	000105-60-2	CAPROLACTAM	000110-60-5	ETHOXYETHANOL, 2-
000095-54-5	PHENYLENEDIAMINE, o-	000105-67-9	DIMETHYLPHENOL, 2,4-	000110-86-1	PYRIDINE
000095-57-8	CHLOROPHENOL, 2-	000106-37-6	DIBROMOBENZENE, 1,4-	000111-15-9	ETHOXYETHANOL ACETATE, 2-
000095-65-8	DIMETHYLPHENOL, 3,4-	000106-42-3	XYLENE, p-	000111-44-4	BIS(2-CHLOROETHYL)ETHER
000095-68-1	DIMETHYLANILINE, 2,4-	000106-44-5	CRESOL, p-	000111-76-2	ETHYLENE GLYCOL MONOBUTYL ETHER
000095-69-2	CHLORO-2-METHYLANILINE, 4-	000106-46-7	DICHLOROBENZENE, 1,4-	000111-90-0	DIETHYLENE GLYCOL MONOETHYL ETHER
000095-70-5	TOLUENE-2,5-DIAMINE	000106-47-8	CHLOROANILINE, p-	000111-91-1	BIS(2-CHLOROETHOXY)METHANE
000095-80-7	TOLUENE-2,4-DIAMINE	000106-49-0	TOLUIDINE, p-	000112-34-5	DIETHYLENE GLYCOL MONOBUTYL ETHER
000095-94-3	TETRACHLOROBENZENE, 1,2,4,5-	000106-50-3	PHENYLENEDIAMINE, p-	000114-28-1	BAYGON
000095-95-4	TRICHLOROPHENOL, 2,4,5-	000106-68-7	EPOXYBUTANE, 1,2-	000115-29-7	ENDOSULFAN
000096-12-8	DIBROMO-3-CHLOROPROPANE, 1,2-	000106-89-8	EPICHLOROHYDRIN	000115-32-2	DICOFOL
000096-18-4	TRICHLOROPROPANE, 1,2,3-	000106-93-4	DIBROMOETHANE, 1,2-	000116-06-3	ALDICARB
000096-19-5	TRICHLOROPROPENE, 1,2,3-	000106-99-0	BUTADIENE, 1,3-	000117-81-7	BIS(2-ETHYLHEXYL)PHTHALATE
000096-33-3	METHYL ACRYLATE	000107-02-8	ACROLEIN	000117-84-0	OCTYL PHTHALATE, DI-N-
000096-45-7	ETHYLENE THIOUREA	000107-05-1	ALLYL CHLORIDE	000118-74-1	HEXACHLOROBENZENE
000097-03-2	ETHYL METHACRYLATE	000107-08-2	DICHLOROETHANE, 1,2-	000118-75-2	CHLORANIL
000098-01-1	FURFURAL	000107-13-1	ACRYLONITRILE	000118-96-7	TRINITROTOLUENE, 2,4,6-
000098-07-7	BENZOTRICHLORIDE	000107-15-3	ETHYLENE DIAMINE	000119-90-4	DIMETHOXYBENZIDINE, 3,3-
000098-56-6	CHLOROBENZOTRIFLUORIDE, 4-	000107-18-6	ALLYL ALCOHOL	000119-93-7	DIMETHYLBENZIDINE, 3,3-
000098-82-8	CUMENE	000107-19-7	PROPARGYL ALCOHOL	000120-12-7	ANTHRACENE
000098-83-9	METHYLSTYRENE, ALPHA-	000107-21-1	ETHYLENE GLYCOL	000120-61-6	DIMETHYLTEREPHTHALATE
000098-86-2	ACETOPHENONE	000107-30-2	CHLOROMETHYL METHYL ETHER	000120-82-1	TRICHLOROBENZENE, 1,2,4-
000098-95-3	NITROBENZENE	000107-98-2	PROPYLENE GLYCOL MONOMETHYL ETHER	000120-83-2	DICHLOROPHENOL, 2,4-
000099-08-1	NITROTOLUENE, m-	000108-05-4	VINYL ACETATE	000121-14-2	DINITROTOLUENE, 2,4-
000099-35-4	TRINITROBENZENE, 1,3,5-	000108-06-1	BIS(2-CHLORO-1-METHYLETHYL)ETHER (TECHNICAL)	000121-44-8	TRIETHYLAMINE
000099-55-8	METHYL-5-NITROANILINE, 2-	000108-10-1	METHYL ISOBUTYL KETONE	000121-69-7	DIMETHYLANILINE, N,N-
000099-59-2	METHOXY-5-NITROANILINE, 2-	000108-31-6	MALEIC ANHYDRIDE	000121-73-3	CHLORONITROBENZENE, p-
000099-65-0	DINITROBENZENE, 1,3-	000108-38-3	XYLENE, m-	000121-75-5	MALATHION
000099-99-0	NITROTOLUENE, p-	000108-39-4	CRESOL, m-	000121-82-4	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE (RDX)
000100-21-0	PHTHALIC ACID, p-	000108-45-2	PHENYLENEDIAMINE, m-	000122-34-9	SIMAZINE
000100-25-4	DINITROBENZENE, 1,4-	000108-87-2	METHYLCYCLOHEXANE	000122-39-4	DIPHENYLAMINE
000100-41-4	ETHYLBENZENE	000108-88-3	TOLUENE	000122-42-9	PROPHAM
000100-42-5	STYRENE	000108-90-7	CHLOROBENZENE	000122-66-7	DIPHENYLHYDRAZINE, 1,2-
000100-44-7	BENZYL CHLORIDE	000108-91-8	CYCLOHEXYLAMINE	000123-09-1	CHLOROPHENYL METHYL SULFIDE, p-
000100-51-6	BENZYL ALCOHOL	000108-94-1	CYCLOHEXANONE	000123-31-9	HYDROQUINONE
000100-52-7	BENZALDEHYDE	000108-95-2	PHENOL	000123-33-1	MALEIC HYDRAZIDE
000101-14-4	METHYLENE-BIS(2-CHLOROANILINE), 4,4'-	000108-98-5	BENZENETHIOL	000123-73-9	CROTONALDEHYDE
000101-21-3	CHLORPROPHAM	000109-69-3	CHLOROBUTANE, 1-	000123-91-1	DIOXANE, 1,4-
000101-55-3	BROMODIPHENYL ETHER, p-	000109-77-3	MALONONITRILE	000124-48-1	DIBROMOCHLOROMETHANE

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CAS NUMBER	CHEMICAL	CAS NUMBER	CHEMICAL	CAS NUMBER	CHEMICAL
000126-98-7	METHACRYLONITRILE	000333-41-5	DIAZINON	000684-93-5	NITROSO-N-METHYLUREA, N-
000126-99-8	CHLORO-1,3-BUTADIENE, 2-	000460-19-6	CYANOGEN	000693-21-0	DIETHYLENE GLYCOL DINITRATE (DEGDN)
000127-18-4	TETRACHLOROETHYLENE	000479-45-8	TRINITROPHENYLMETHYLNITRAMINE	000709-98-8	PROPANIL
000129-00-0	PYRENE	000504-24-5	AMINOPYRIDINE, 4-	000732-11-6	PHOSMET
000131-11-3	DIMETHYLPHthalATE	000506-61-6	POTASSIUM SILVER CYANIDE	000759-73-9	NITROSO-N-ETHYLUREA, N-
000131-89-5	DINITRO-O-CYCLOHEXYL PHENOL, 4,6-	000506-64-9	SILVER CYANIDE	000759-94-4	EPTC
000133-08-2	CAPTAN	000506-68-3	CYANOGEN BROMIDE	000764-41-0	DICHLORO-2-BUTENE, 1,4-
000133-07-3	FOLPET	000506-77-4	CYANOGEN CHLORIDE	000765-34-4	GLYCIDYL
000133-80-4	CHLORAMBEN	000507-20-0	BUTYLCHLORIDE, T-	000822-06-0	HEXAMETHYLENE DIISOCYANATE, 1,6-
000137-28-8	THIRAM	000510-15-6	CHLOROBENZILATE	000823-40-5	TOLUENE-2,6-DIAMINE
000139-40-2	PROPAZINE	000512-56-1	TRIMETHYL PHOSPHATE	000834-12-8	AMETRYN
000140-57-8	ARAMITE	000528-29-0	DINITROBENZENE, 1,2-	000886-50-0	TERBUTRYN
000140-88-6	ETHYL ACRYLATE	000531-82-8	FURIUM	000924-16-3	NITROSO-DI-N-BUTYLAMINE, N-
000141-86-2	BIDRIN	000532-27-4	CHLOROACETOPHENONE, 2-	000930-55-2	NITROSYLROLIDINE, N-
000141-78-6	ETHYL ACETATE	000540-59-0	DICHLOROETHYLENE, 1,2-, (MIXED ISOMERS)	000934-73-6	CHLOROPHENYL METHYL SULFOXIDE
000142-82-5	HEPTANE, N-	000540-73-8	DIMETHYLHYDRAZINE, 1,2-	000944-22-9	FONOFO
000143-33-9	SODIUM CYANIDE	000541-73-1	DICHLOROBENZENE, 1,3-	000950-10-7	MEPHOSFOLAN
000145-73-3	ENDOTHALL	000542-62-1	BARIUM CYANIDE	000950-37-8	METHIDATHION
000148-18-5	SODIUM DIETHYLDITHiocarbamate	000542-75-6	DICHLOROPROPENE, 1,3-	000957-51-7	DIPHENAMID
000150-50-5	MERPHOS	000542-88-1	BIS(CHLOROMETHYL)ETHER	000961-11-5	STIROFOS (TETRACHLOROVINPHOS)
000151-50-8	POTASSIUM CYANIDE	000542-92-7	CYCLOPENTADIENE	001024-57-3	HEPTACHLOR EPOXIDE
000152-16-9	OCTAMETHYLpyrophosphoramide	000544-92-3	COPPER CYANIDE	001071-83-6	GLYPHOSATE
000156-59-2	DICHLOROETHYLENE, 1,2-C-	000566-88-7	NITROGUANIDINE	001114-71-2	PEBULATE
000156-60-5	DICHLOROETHYLENE, 1,2-T-	000557-21-1	ZINC CYANIDE	001116-54-7	NITROSODIETHANOLAMINE, N-
000191-24-2	BENZO[G,H,I]PERYLENE	000563-12-2	ETHION	001163-19-5	DECABROMODIPHENYL ETHER
000193-39-5	INDENO[1,2,3-cd]PYRENE	000563-68-8	THALLIUM ACETATE	001309-84-4	ANTIMONY TRIOXIDE
000205-99-2	BENZO[B]FLUORANTHENE	000576-26-1	DIMETHYLPHENOL, 2,6-	001314-32-5	THALLIC OXIDE
000206-44-0	FLUORANTHENE	000581-27-5	AMINOPHENOL, m-	001314-80-9	ANTIMONY PENTOXIDE
000207-08-9	BENZO[K]FLUORANTHENE	000592-01-8	CALCIUM CYANIDE	001314-82-1	VANADIUM PENTOXIDE
000218-01-9	CHRYSENE	000593-60-2	VINYL BROMIDE	001314-84-7	ZINC PHOSPHIDE
000298-00-0	METHYL PARATHION	000594-15-0	TRIBROMOCHLOROMETHANE	001330-20-7	XYLENE, MIXTURE
000288-02-2	PHORATE	000594-18-3	DIBROMODICHLOROMETHANE	001332-21-4	ASBESTOS
000298-04-4	DISULFOTON	000598-77-6	TRICHLOROPROPANE, 1,1,2-	001332-81-6	ANTIMONY TETOXIDE
000299-84-3	RONNEL	000606-20-2	DINITROTOLUENE, 2,6-	001336-36-3	POLYCHLORINATED BIPHENYLS
000300-78-5	NALED	000608-73-1	HEXAChLOROCYCLOHEXANE, TECHNICAL	001445-75-6	DIISOPROPYL Methylphosphonate
000302-01-2	HYDRAZINE	000608-93-5	PENTACHLOROBENZENE	001563-68-2	CARBOFURAN
000304-61-0	ANTIMONY POTASSIUM TARTRATE	000615-54-3	TRIBROMOBENZENE, 1,2,4-	001569-02-4	PROPYLENE GLYCOL MONOETHYL ETHER
000309-00-2	ALDRIN	000616-23-9	DICHLOROPROPANOL, 2,3-	001582-09-8	TRIFLURALIN
000311-45-5	DIETHYL-P-NITROPHENYLPHOSPHATE	000617-84-5	DIETHYLFORMAMIDE	001596-84-5	ALAR
000319-84-6	HEXACHLOROCYCLOHEXANE, ALPHA-	000621-64-7	NITROSO-DI-N-PROPYLAMINE, N-	001610-18-0	PROMETON
000319-85-7	HEXACHLOROCYCLOHEXANE, BETA-	000630-10-4	SELENOUREA	001634-04-4	METHYL TERT-BUTYL ETHER (MTBE)
000319-88-8	HEXACHLOROCYCLOHEXANE, DELTA-	000630-20-8	TETRACHLOROETHANE, 1,1,1,2-	001646-88-4	ALDICARB SULFONE
000330-54-1	DIURON	000634-93-5	TRICHLOROANILINE, 2,4,6-	001689-84-5	BROMOXYNIL
000330-55-2	LINURON	000636-21-5	METHYLANILINE HYDROCHLORIDE, 2-	001689-99-2	BROMOXYNIL OCTANOATE

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CAS NUMBER	CHEMICAL	CAS NUMBER	CHEMICAL	CAS NUMBER	CHEMICAL
001748-01-6	TCDD, 2,3,7,8-	005234-68-4	CARBOXIN	008007-45-2	COKE OVEN EMISSIONS
001762-26-1	TRIMETHYLETHYL LEAD	005598-13-0	CHLORPYRIFOS METHYL	008018-01-7	MANCOZEB
001762-28-3	METHYLTRIETHYL LEAD	005902-51-2	TERBACIL	008065-48-3	DEMETON
001832-54-8	ISOPROPYL METHYL PHOSPHONIC ACID	006108-10-7	HEXAChLOROCYCLOHEXANE, EPSILON	010034-93-2	HYDRAZINE SULFATE
001861-32-1	DACTHAL	006533-73-9	THALLIUM CARBONATE	010049-04-4	CHLORINE DIOXIDE
001861-40-1	BENEFIN	006818-03-7	TRIPROPYL LEAD	010102-43-9	NITRIC OXIDE
001897-45-6	CHLOROTHALONIL	007287-19-6	PROMETRYN	010102-44-0	NITROGEN DIOXIDE
001910-42-5	PARAQUAT	007439-92-1	LEAD AND COMPOUNDS	010102-45-1	THALLIUM (I) NITRATE
001912-24-9	ATRAZINE	007439-96-5	MANGANESE (Diet)	010265-92-6	METHAMIDOPHOS
001918-00-9	DICAMBA	007439-96-5	MANGANESE (Water)	010453-86-8	RESMETHRIN
001918-02-1	PICLORAM	007439-97-6	MERCURY, INORGANIC	010595-95-6	NITROSOMETHYLETHYLAMINE, N-
001918-15-7	PROPACHLOR	007439-98-7	MOLYBDENUM	010599-90-3	MONOCHLORAMINE
001920-90-7	TETRABUTYL LEAD	007440-02-0	NICKEL SOLUBLE SALTS	011097-69-1	AROCLOR 1254
001929-77-7	VERNOLATE	007440-22-4	SILVER	012035-72-2	NICKEL SUBSULFIDE
001929-82-4	NITRAPYRIN	007440-24-6	STRONTIUM, STABLE	012039-52-0	THALLIUM SELENITE
001937-37-7	DIRECT BLACK 38	007440-31-5	TIN	012122-67-7	ZINEB
002008-41-5	BUTYLATE	007440-38-0	ANTIMONY (METALLIC)	012427-38-2	MANEB
002014-83-7	TRICHLOROTOLUENE, ALPHA 2,6-	007440-38-2	ARSENIC, INORGANIC	012674-11-2	AROCLOR 1016
002050-47-7	DIBROMODIPHENYL ETHER, p,p'	007440-39-3	BARIUM	013071-79-9	TERBUFOS
002077-46-5	TRICHLOROTOLUENE, 2,3,6-	007440-41-7	BERYLLIUM	013463-39-3	NICKEL CARBONYL
002104-84-5	ETHYL-p-NITROPHENYL PHOSPHONATE	007440-42-8	BORON and BORATES ONLY	013583-03-8	QUINALPHOS
002104-98-3	BROMOPHOS	007440-43-9	CADMIUM (Diet)	013684-63-4	PHENMEDIPHAM
002164-17-2	FLUOMETURON	007440-43-9	CADMIUM (Water)	013718-26-8	SODIUM METAVANADATE
002212-67-1	MOLINATE	007440-50-8	COPPER	014797-55-8	NITRATE
002303-18-4	DIALLATE	007440-62-2	VANADIUM, METALLIC	014797-65-0	NITRITE
002303-17-6	TRIALLATE	007440-66-6	ZINC (METALLIC)	015299-99-7	NAPROPAMIDE
002312-35-8	PROPARGITE	007442-13-9	TRIMETHYL LEAD	015972-60-8	ALACHLOR
002385-85-5	MIREX	007448-18-6	THALLIUM SULFATE	016065-83-1	CHROMIUM (III) (INSOLUBLE SALTS)
002425-06-1	CAPTAFOL	007448-34-6	SELENIUM SULFIDE	016071-86-8	DIRECT BROWN 95
002429-74-5	NIAGARA BLUE 48	007637-07-2	BORON TRIFLUORIDE	016672-87-0	ETHEPHON
002439-10-3	DODINE	007647-01-0	HYDROGEN CHLORIDE	016752-77-5	METHOMYL
002602-46-2	DIRECT BLUE 6	007684-41-7	AMMONIA	017804-35-2	BENOMYL
002610-05-1	DIRECT SKY BLUE	007723-14-0	WHITE PHOSPHORUS	018540-29-8	CHROMIUM (VI)
002691-41-0	OCTAHYDRO-1,3,5,7-TETRANITRO-1,3,5,7-TETRA (HMX)	007773-06-0	AMMONIUM SULFAMATE	019044-88-3	ORYZALIN
002921-88-2	CHLORPYRIFOS	007782-41-4	FLUORIDE	019408-74-3	HEXAChLORODIBENZO-p-DIOXIN, MIXTURE
003165-93-3	CHLORO-2-METHYLANILINE HCl, 4-	007782-49-2	SELENIUM	019666-30-9	OXADIAZON
003337-71-1	ASULAM	007782-50-5	CHLORINE	020859-73-8	ALUMINUM PHOSPHIDE
003380-34-5	TRICHLORO-2'-HYDROXYDIPHENYLETHER	007783-00-8	SELENIOUS ACID	021087-64-9	METRIBUZIN
003383-96-8	TEMEPHOS	007783-06-4	HYDROGEN SULFIDE	021436-96-4	DIMETHYLANILINE HCl, 2,4-
003440-75-3	TETRAPROPYL LEAD	007784-42-1	ARSINE	021564-17-0	TCMTB
003689-24-5	TETRAETHYL DITHIOPYROPHOSPHATE	007791-12-0	THALLIUM CHLORIDE	021725-46-2	CYANAZINE
004549-40-0	NITROSOMETHYLVINYLAMINE, N-	007803-51-2	PHOSPHINE	022224-92-6	FENAMPHOS
005216-25-1	TETRACHLOROTOLUENE, p-ALPHA, ALPHA, ALPHA-	008001-35-2	TOXAPHENE	022967-92-6	METHYL MERCURY
005224-23-7	TRIETHYL LEAD	008001-58-9	CREOSOTE	023135-22-0	OXAMYL

## CHEMICAL COMPOUNDS FOUND IN IRIS AND HEAST IN CAS NUMBER ORDER

CAS NUMBER	CHEMICAL	CAS NUMBER	CHEMICAL	CAS NUMBER	CHEMICAL
023564-05-8	THIOPHANATE-METHYL	057837-18-1	METALAXYL	NA	REFRACTORY CERAMIC FIBERS
023950-58-5	KERB	058138-08-2	TRIDIPHANE	NA	THALLIUM (SOLUBLE SALTS)
024307-26-4	MEPONIQUAT CHLORIDE	059756-60-4	FLURIDONE	NA	URANIUM (SOLUBLE SALTS)
025013-15-4	METHYL STYRENE (MIXED ISOMERS)	060207-90-1	PROPICONAZOLE		
025057-89-0	BENTAZON	060238-56-4	CHLORTHIOPHOS		
025154-42-1	MONOCHLOROBUTANES	060568-05-0	FURMECYCLOX		
026329-35-5	PENTACHLOROCYCLOPENTADIENE	062478-59-9	SODIUM ACIFLUORFEN		
026389-36-0	PROFLURALIN	064902-72-3	CHLORSULFURON		
026628-22-8	SODIUM AZIDE	065195-55-3	AVERMECTIN B1		
027314-13-2	NORFLURAZON	066215-27-8	CYROMAZINE		
027774-13-6	VANADYL SULFATE	066332-96-5	FLUTOLANIL		
028249-77-6	THIOBENCARB	066841-25-6	TRALOMETHRIN		
029232-83-7	PIRIMPHOS-METHYL	067485-29-4	AMDRO		
030560-19-1	ACEPHATE	067747-08-5	PROCHLORAZ		
032534-81-9	PENTABROMODIPHENYL ETHER	068085-85-8	CYHALOTHRIN/KARATE		
032536-52-0	OCTABROMODIPHENYL ETHER	068358-37-5	BAYTHROID		
033089-61-1	AMITRAZ	069408-94-5	FLUVALINATE		
033663-50-2	TRICHLOROANILINE HCL, 2,4,6-	069806-40-2	HALOXYFOP-METHYL		
033820-53-0	ISOPROPALIN	072178-02-0	FOMESAFEN		
034014-18-1	TEBUTHIURON	073508-94-2	CHLORODIBROMOETHANE		
034256-82-1	ACETOCHLOR	074051-80-2	SETHOXYDIM		
035367-38-5	DIFLUBENZURON	074115-24-5	APOLLO		
035554-44-0	IMAZALIL	074223-64-6	ALLY		
036734-19-7	IPRODIONE	076578-14-8	ASSURE		
036907-42-3	VANADIUM SULFATE	076738-62-0	PACLOBUTRAZOL		
039148-24-8	FOSETYL-AL	077182-82-2	GLUFOSINATE-AMMONIUM		
039196-18-4	THIOFANOX	077501-63-4	LACTOFEN		
039515-41-8	FENPROPATHRIN	078587-05-0	SAVEY		
039638-32-8	BIS(2-CHLOROISOPROPYL)ETHER	079277-27-3	HARMONY		
040487-42-1	PENDIMETHALIN	081335-37-7	IMAZAQUIN		
041851-50-7	CHLOROCYCLOPENTADIENE	081335-77-5	PURSUIT		
042874-03-3	GOAL	082097-50-5	TRIASULFURON		
043121-43-3	BAYLETON	082558-50-7	ISOXABEN		
043222-48-6	DIFENOZOQUAT	082857-04-3	BIPHENTHRIN		
048690-94-0	TRIBROMODIPHENYL ETHER	083055-99-6	LONDAX		
050471-44-8	VINCLOZOLIN	085509-19-9	NUSTAR		
051218-45-2	METOLACHLOR	088671-89-0	RALLY		
061235-04-2	HEXAZINONE	090982-32-4	CHLORIMURON-ETHYL		
061630-58-1	PYDRIN	091465-08-6	KARATE		
062315-07-8	CYPERMETHRIN	101200-48-0	EXPRESS		
062845-53-1	PERMETHRIN	107584-40-7	DIMETHYLETHYL LEAD		
055285-14-8	CARBOSULFAN	NA	LEAD ALKYLs		
055290-64-7	DIMETHIPIN	NA	NICKEL REFINERY DUST		
056425-91-3	FLURPRIMIDOL	NA	POLYBROMINATED BIPHENYLS		

## **SECTION TWO**

## **SUMMARY OF REFERENCE DOSES (RFD), REFERENCE CONCENTRATIONS (RFC), SLOPE FACTORS ( $Q_1^*$ ), UNIT RISKS, AND EPA CANCER CLASSIFICATION FROM IRIS AND HEAST**

**OCTOBER 1994**

The following tables (in chemical name order and CAS number order, respectively) have been prepared from the US EPA *Integrated Risk Information System* (IRIS), updated through October 1994, and from the EPA *Health Effects Assessment Summary Tables* (Annual FY 1994 -- March 1994; and Supplement No. 1 -- July 1994). IRIS, which is updated monthly, contains Agency consensus information. HEAST contains EPA's interim numeric risk estimates. For further information about IRIS contact IRIS User Support, (513) 569-7254.

The source of the values listed with each compound is identified by a superscript, "a" for IRIS and "b" for HEAST. IRIS provides only chronic RfD (oral) and RfC (inhalation) values, while subchronic RfDs or RfCs, as well as chronic RfDs and RfCs for certain chemicals, are listed in HEAST. RfCs that have been derived from dose conversions are identified by a superscript "c." Inhalation Slope Factors ( $Q_1^*$ ) have been removed from IRIS; however, IRIS is providing inhalation unit risk values for some chemicals (denoted by a superscript "a" in the tables). HEAST lists inhalation slope factors for some chemicals. Oral slope factors and unit risk values from IRIS and/or HEAST are also provided in the tables.

**SUMMARY OF REFERENCE DOSES (RFD), REFERENCE CONCENTRATIONS (RFC),  
SLOPE FACTORS ( $Q_1'$ ), UNIT RISKS, AND EPA CANCER CLASSIFICATION  
FROM IRIS AND HEAST**

**IN CHEMICAL ORDER**

**OCTOBER 1994**

**SUMMARY OF REFERENCE DOSES (RfD), REFERENCE CONCENTRATIONS (RfC), SLOPE FACTORS ( $q_1$ ),  
UNIT RISKS, AND EPA CANCER CLASSIFICATION FROM IRIS AND HEAST IN CHEMICAL ORDER**

Chemical	CAS Number	Oral RfD (mg/kg/day)		Oral Slope Factor (mg/kg/day) <sup>-1</sup>	Oral Unit Risk (µg/L) <sup>-1</sup>	Inhalation RfC (mg/m <sup>3</sup> )		Inhalation Slope Factor (mg/kg/day) <sup>-1</sup>	Inhalation Unit Risk (µg/m <sup>3</sup> ) <sup>-1</sup>	EPA Class
		Chronic	Subchronic			Chronic	Subchronic			
ACENAPHTHENE	000083-32-9	6.00E-02 <sup>a</sup>	6.00E-01 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
ACEPHATE	030560-19-1	4.00E-03 <sup>a</sup>	4.00E-03 <sup>b</sup>	8.70E-03 <sup>a</sup>	2.50E-07 <sup>b</sup>	NA	NA	NA	NA	C <sup>a</sup>
ACETALDEHYDE	000075-07-0	NA	NA	NA	NA	9.00E-03 <sup>b</sup>	NA	NA	2.20E-06 <sup>a</sup>	B2 <sup>a</sup>
ACETOCHLOR	034256-82-1	2.00E-02 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
ACETONE	000067-64-1	1.00E-01 <sup>a</sup>	1.00E+00 <sup>b</sup>	NA	NA	NA	NA	NA	NA	D <sup>a</sup>
ACETONE CYANOHYDRIN	000075-86-5	7.00E-02 <sup>b</sup>	7.00E-02 <sup>b</sup>	NA	NA	1.00E-02 <sup>b,c</sup>	1.00E-01 <sup>b,c</sup>	NA	NA	NA
ACETONITRILE	000075-05-8	6.00E-03 <sup>a</sup>	6.00E-02 <sup>b</sup>	NA	NA	5.00E-02 <sup>b,c</sup>	5.00E-01 <sup>b,c</sup>	NA	NA	NA
ACETOPHENONE	000098-86-2	1.00E-01 <sup>a</sup>	1.00E+00 <sup>b</sup>	NA	NA	NA	NA	NA	NA	D <sup>a</sup>
ACROLEIN	000107-02-8	NA <sup>a</sup>	NA <sup>a</sup>	NA	NA	2.00E-05 <sup>a</sup>	NA <sup>a</sup>	NA	NA	C <sup>a</sup>
ACRYLAMIDE	000079-06-1	2.00E-04 <sup>a</sup>	2.00E-03 <sup>b</sup>	4.50E+00 <sup>a</sup>	1.30E-04 <sup>a</sup>	NA	NA	4.50E+00 <sup>b</sup>	1.30E-03 <sup>a</sup>	B2 <sup>a</sup>
ACRYLIC ACID	000079-10-7	5.00E-01 <sup>a</sup>	5.00E-01 <sup>b</sup>	NA	NA	1.00E-03 <sup>a</sup>	3.00E-03 <sup>b</sup>	NA	NA	NA
ACRYLONITRILE	000107-13-1	1.00E-03 <sup>b</sup>	1.00E-02 <sup>b</sup>	5.40E-01 <sup>a</sup>	1.50E-05 <sup>a</sup>	2.00E-03 <sup>a</sup>	NA	2.40E-01 <sup>b</sup>	6.80E-05 <sup>a</sup>	B1 <sup>a</sup>
ALACHLOR	015972-60-8	1.00E-02 <sup>a</sup>	1.00E-02 <sup>b</sup>	8.00E-02 <sup>b</sup>	2.30E-06 <sup>b</sup>	NA	NA	NA	NA	B2 <sup>b</sup>
ALAR	001596-84-5	1.50E-01 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
ALDICARB	000116-06-3	1.00E-03 <sup>a</sup>	1.00E-03 <sup>b</sup>	NA	NA	NA	NA	NA	NA	D <sup>a</sup>
ALDICARB SULFONE	001646-88-4	1.00E-03 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
ALDRIN	000309-00-2	3.00E-05 <sup>a</sup>	3.00E-05 <sup>b</sup>	1.70E+01 <sup>a</sup>	4.90E-04 <sup>a</sup>	NA	NA	1.70E+01 <sup>b</sup>	4.90E-03 <sup>a</sup>	B2 <sup>a</sup>
ALLY	074223-64-6	2.50E-01 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
ALLYL ALCOHOL	000107-18-6	5.00E-03 <sup>a</sup>	5.00E-02 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
ALLYL CHLORIDE	000107-05-1	NA	NA	NA	NA	1.00E-03 <sup>a</sup>	1.00E-02 <sup>b</sup>	NA	NA	C <sup>a</sup>
ALUMINUM PHOSPHIDE	020859-73-8	4.00E-04 <sup>a</sup>	4.00E-04 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
AMDRO	067485-29-4	3.00E-04 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
AMETRYN	000834-12-8	9.00E-03 <sup>a</sup>	9.00E-02 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
AMINOPHENOL, m-	000591-27-5	7.00E-02 <sup>b</sup>	7.00E-01 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
AMINOPYRIDINE, 4-	000504-24-5	2.00E-05 <sup>b</sup>	2.00E-04 <sup>b</sup>	NA	NA	NA	NA	NA	NA	D <sup>a</sup>

**SUMMARY OF REFERENCE DOSES (RfD), REFERENCE CONCENTRATIONS (RfC), SLOPE FACTORS ( $q_1$ ),  
UNIT RISKS, AND EPA CANCER CLASSIFICATION FROM IRIS AND HEAST IN CHEMICAL ORDER**

Chemical	CAS Number	Oral RfD (mg/kg/day)		Oral Slope Factor (mg/kg/day) <sup>-1</sup>	Oral Unit Risk (µg/L) <sup>-1</sup>	Inhalation RfC (mg/m <sup>3</sup> )		Inhalation Slope Factor (mg/kg/day) <sup>-1</sup>	Inhalation Unit Risk (µg/m <sup>3</sup> ) <sup>-1</sup>	EPA Class
		Chronic	Subchronic			Chronic	Subchronic			
AMITRAZ	033089-51-1	2.50E-03 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
AMMONIA	007664-41-7	NA	NA	NA	NA	1.00E-01 <sup>a</sup>	1.00E-01	NA	NA	NA
AMMONIUM SULFAMATE	007773-06-0	2.00E-01 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA	NA
ANILINE	000062-53-3	NA	NA	5.70E-03 <sup>a</sup>	1.60E-07 <sup>a</sup>	1.00E-03 <sup>a</sup>	1.00E-02	NA	NA	B2 <sup>a</sup>
ANTHracene	000120-12-7	3.00E-01 <sup>a</sup>	3.00E+00 <sup>b</sup>	NA	NA	NA	NA	NA	NA	D <sup>a</sup>
ANTIMONY (METALLIC)	007440-36-0	4.00E-04 <sup>a</sup>	4.00E-04 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
ANTIMONY PENTOXIDE	001314-60-9	5.00E-04 <sup>b</sup>	5.00E-04 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
ANTIMONY POTASSIUM TARTRATE	000304-61-0	8.00E-04 <sup>b</sup>	8.00E-04 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
ANTIMONY TETROXIDE	001332-81-8	4.00E-04 <sup>b</sup>	4.00E-04 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
ANTIMONY TRIOXIDE	001309-64-4	4.00E-04 <sup>b</sup>	4.00E-04 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
APOLLO	074115-24-5	1.30E-02 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	C <sup>a</sup>
ARAMITE	000140-57-8	5.00E-02 <sup>b</sup>	1.00E-01 <sup>b</sup>	2.50E-02 <sup>a</sup>	7.10E-07 <sup>a</sup>	NA	NA	2.50E-02 <sup>b</sup>	7.10E-06 <sup>a</sup>	B2 <sup>a</sup>
AROCLOR 1016	012674-11-2	7.00E-05 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
AROCLOR 1254	011097-69-1	2.00E-05 <sup>a</sup>	5.00E-06 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
ARSENIC, INORGANIC	007440-38-2	3.00E-04 <sup>a</sup>	3.00E-04 <sup>b</sup>	NA	5.00E-05 <sup>a</sup>	NA	NA	5.00E+01 <sup>b</sup>	4.30E-03 <sup>a</sup>	A <sup>a</sup>
ARSINE	007784-42-1	NA	NA	NA	NA	5.00E-05 <sup>a</sup>	NA	NA	NA	NA
ASBESTOS	001332-21-4	NA	NA	NA	NA	NA	NA	NA	2.30E-01 <sup>a,h</sup>	A <sup>a</sup>
ASSURE	076578-14-8	8.00E-03 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	D <sup>a</sup>
ASULAM	003337-71-1	5.00E-02 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
ATRAZINE	001912-24-8	3.50E-02 <sup>a</sup>	3.50E-02 <sup>b</sup>	2.22E-01 <sup>b</sup>	6.30E-06 <sup>b</sup>	NA	NA	NA	NA	C <sup>b</sup>
AVERMECTIN B1	065195-55-3	4.00E-04 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
AZOBENZENE	000103-33-3	NA	NA	1.10E-01 <sup>a</sup>	3.10E-06 <sup>a</sup>	NA	NA	1.10E-01 <sup>b</sup>	3.10E-05 <sup>a</sup>	B2 <sup>a</sup>
BARIUM	007440-39-3	7.00E-02 <sup>a</sup>	7.00E-02 <sup>b</sup>	NA	NA	5.00E-04 <sup>b,c</sup>	5.00E-03 <sup>b,c</sup>	NA	NA	NA
BARIUM CYANIDE	000542-62-1	1.00E-01 <sup>b</sup>	1.00E-01 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
BAYGON	000114-26-1	4.00E-03 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA

**SUMMARY OF REFERENCE DOSES (RfD), REFERENCE CONCENTRATIONS (RfC), SLOPE FACTORS ( $q_1$ ),  
UNIT RISKS, AND EPA CANCER CLASSIFICATION FROM IRIS AND HEAST IN CHEMICAL ORDER**

Chemical	CAS Number	Oral RfD (mg/kg/day)		Oral Slope Factor (mg/kg/day) <sup>-1</sup>	Oral Unit Risk (µg/L) <sup>-1</sup>	Inhalation RfC (mg/m <sup>3</sup> )		Inhalation Slope Factor (mg/kg/day) <sup>-1</sup>	Inhalation Unit Risk (µg/m <sup>3</sup> ) <sup>-1</sup>	EPA Class
		Chronic	Subchronic			Chronic	Subchronic			
BAYLETON	043121-43-3	3.00E-02 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
BAYTHROID	068359-37-5	2.50E-02 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
BENEFIN	001861-40-1	3.00E-01 <sup>a</sup>	3.00E-01 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
BENOMYL	017804-35-2	5.00E-02 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
BENTAZON	025057-89-0	2.50E-03 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
BENZALDEHYDE	000100-52-7	1.00E-01 <sup>a</sup>	1.00E+00 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
BENZENE	000071-43-2	NA	NA	2.90E-02 <sup>a</sup>	8.30E-07 <sup>a</sup>	NA	NA	2.90E-02 <sup>b</sup>	8.30E-06 <sup>a</sup>	A <sup>a</sup>
BENZENETHIOL	000108-98-5	1.00E-05 <sup>b</sup>	1.00E-04 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
BENZIDINE	000092-87-5	3.00E-03 <sup>a</sup>	3.00E-03 <sup>b</sup>	2.30E+02 <sup>a</sup>	6.70E-03 <sup>a</sup>	NA	NA	2.30E+02 <sup>b</sup>	6.70E-02 <sup>a</sup>	A <sup>a</sup>
BENZOIC ACID	000065-85-0	4.00E+00 <sup>a</sup>	4.00E+00 <sup>b</sup>	NA	NA	NA	NA	NA	NA	D <sup>a</sup>
BENZOTRICHLORIDE	000098-07-7	NA	NA	1.30E+01 <sup>a</sup>	3.80E-04 <sup>a</sup>	NA	NA	NA	NA	B2 <sup>a</sup>
BENZO(A)PYRENE	000050-32-8	NA	NA	7.30E+00 <sup>a</sup>	2.10E-04 <sup>a</sup>	NA	NA	NA	NA	B2 <sup>a</sup>
BENZO(B)FLUORANTHENE	000205-99-2	NA	NA <sup>a</sup>	NA	NA	NA	NA	NA	NA	B2 <sup>a</sup>
BENZO(G,H,I)PERYLENE	000191-24-2	NA	NA	NA	NA	NA	NA	NA	NA	D <sup>a</sup>
BENZO(K)FLUORANTHENE	000207-06-9	NA	NA	NA	NA	NA	NA	NA	NA	B2 <sup>a</sup>
BENZYL ALCOHOL	000100-51-6	3.00E-01 <sup>b</sup>	1.00E+00 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
BENZYL CHLORIDE	000100-44-7	NA	NA	1.70E-01 <sup>a</sup>	4.90E-06 <sup>a</sup>	NA	NA	NA	NA	B2 <sup>a</sup>
BENZ[A]ANTHRACENE	000056-55-3	NA	NA	NA	NA	NA	NA	NA	NA	B2 <sup>a</sup>
BERYLLIUM	007440-41-7	5.00E-03 <sup>a</sup>	5.00E-03 <sup>b</sup>	4.30E+00 <sup>a</sup>	1.20E-04 <sup>a</sup>	NA	NA	8.40E+00 <sup>b</sup>	2.40E-03 <sup>a</sup>	B2 <sup>a</sup>
BIDRIN	000141-68-2	1.00E-04 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
BIPHENTHRIN	082657-04-3	1.50E-02 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
BIPHENYL, 1,1'-	000092-52-4	5.00E-02 <sup>a</sup>	5.00E-02 <sup>b</sup>	NA	NA	NA	NA	NA	NA	D <sup>a</sup>
BIS(2-CHLORO-1-METHYLETHYL)ETHER (TECHNICAL)	000108-06-1	NA	NA	7.00E-02 <sup>b</sup>	2.00E-06 <sup>b</sup>	NA	NA	3.50E-02 <sup>b</sup>	1.00E-05 <sup>b</sup>	C <sup>b</sup>
BIS(2-CHLOROETHOXY)METHANE	000111-91-1	NA	NA	NA	NA	NA	NA	NA	NA	D <sup>a</sup>
BIS(2-CHLOROETHYL)ETHER	000111-44-4	NA	NA	1.10E+00 <sup>a</sup>	3.30E-05 <sup>a</sup>	NA	NA	1.10E+00 <sup>b</sup>	3.30E-04 <sup>a</sup>	B2 <sup>a</sup>

**SUMMARY OF REFERENCE DOSES (RfD), REFERENCE CONCENTRATIONS (RFC), SLOPE FACTORS ( $q^{-1}$ ),  
UNIT RISKS, AND EPA CANCER CLASSIFICATION FROM IRIS AND HEAST IN CHEMICAL ORDER**

Chemical	CAS Number	Oral RfD (mg/kg/day)		Oral Slope Factor (mg/kg/day) <sup>-1</sup>	Oral Unit Risk (µg/L) <sup>-1</sup>	Inhalation RFC (mg/m <sup>3</sup> )		Inhalation Slope Factor (mg/kg/day) <sup>-1</sup>	Inhalation Unit Risk (µg/m <sup>3</sup> ) <sup>-1</sup>	EPA Class
		Chronic	Subchronic			Chronic	Subchronic			
BIS(2-CHLOROISOPROPYL)ETHER	039638-32-9	4.00E-02 <sup>a</sup>	4.00E-02 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
BIS(2-ETHYLHEXYL)PHTHALATE	000117-81-7	2.00E-02 <sup>a</sup>	2.00E-02 <sup>b,e</sup>	1.40E-02 <sup>a</sup>	4.00E-07 <sup>a</sup>	NA	NA	NA	NA	B2 <sup>a</sup>
BIS(CHLOROMETHYL)ETHER	000542-88-1	NA	NA	2.20E+02 <sup>b</sup>	6.20E-03 <sup>a</sup>	NA	NA	2.20E+02 <sup>b</sup>	6.20E-02 <sup>a</sup>	A <sup>a</sup>
BISPHENOL A	000080-05-7	5.00E-02 <sup>a</sup>	6.00E-01 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
BORON TRIFLUORIDE	007637-07-2	NA	NA	NA	NA	7.00E-04 <sup>b</sup>	7.00E-03 <sup>b</sup>	NA	NA	NA
BORON and BORATES ONLY	007440-42-8	9.00E-02 <sup>a</sup>	9.00E-02 <sup>b</sup>	NA	NA	2.00E-02 <sup>b</sup>	2.00E-02 <sup>b</sup>	NA	NA	NA
BROMOCHLOROMETHANE	000074-97-5	NA	NA	NA	NA	NA	NA	NA	NA	D <sup>a</sup>
BROMODICHLOROMETHANE	000075-27-4	2.00E-02 <sup>a</sup>	2.00E-02 <sup>b</sup>	6.20E-02 <sup>a</sup>	1.80E-06 <sup>a</sup>	NA	NA	NA	NA	B2 <sup>a</sup>
BROMODIPHENYL ETHER, p-	000101-55-3	NA	NA	NA	NA	NA	NA	NA	NA	D <sup>a</sup>
BROMOFORM	000075-25-2	2.00E-02 <sup>a</sup>	2.00E-01 <sup>b</sup>	7.90E-03 <sup>a</sup>	2.30E-07 <sup>a</sup>	NA	NA	3.80E-03 <sup>b</sup>	1.10E-06 <sup>a</sup>	B2 <sup>a</sup>
BROMOMETHANE	000074-83-9	1.40E-03 <sup>a</sup>	1.40E-02 <sup>b,e</sup>	NA	NA	5.00E-03 <sup>a</sup>	5.00E-03 <sup>b,e</sup>	NA	NA	D <sup>a</sup>
BROMOPHOS	002104-96-3	5.00E-03 <sup>b</sup>	5.00E-02 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
BROMOTRICHLOROMETHANE	000075-82-7	NA	NA	NA	NA	NA	NA	NA	NA	D <sup>a</sup>
BROMOXYNIL	001689-84-5	2.00E-02 <sup>a</sup>	2.00E-02 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
BROMOXYNIL OCTANOATE	001689-99-2	2.00E-02 <sup>a</sup>	2.00E-02 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
BUTADIENE, 1,3-	000106-99-0	NA	NA	NA	NA	NA	NA	1.80E+00 <sup>b</sup>	2.80E-04 <sup>a</sup>	B2 <sup>a</sup>
BUTANOL, N-	000071-38-3	1.00E-01 <sup>a</sup>	1.00E+00 <sup>b</sup>	NA	NA	NA	NA	NA	NA	D <sup>a</sup>
BUTYL BENZYL PHTHALATE	000085-68-7	2.00E-01 <sup>a</sup>	2.00E+00 <sup>b</sup>	NA	NA	NA	NA	NA	NA	C <sup>a</sup>
BUTYRATE	002008-41-5	5.00E-02 <sup>a</sup>	5.00E-02 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
BUTYLCHLORIDE, T-	000507-20-0	NA	NA	NA	NA	NA	NA	NA	NA	D <sup>a</sup>
BUTYLPHTHALYL BUTYLGLYCOLATE	000085-70-1	1.00E+00 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
CACODYLIC ACID	000075-60-5	3.00E-03 <sup>b</sup>	3.00E-02 <sup>b</sup>	NA	NA	NA	NA	NA	NA	D <sup>a</sup>
CADMIUM (Diet)	007440-43-9	1.00E-03 <sup>a</sup>	NA	NA	NA	NA	NA	6.10E+00 <sup>b</sup>	1.80E-03 <sup>a</sup>	B1 <sup>a</sup>
CADMIUM (Water)	007440-43-9	5.00E-04 <sup>a</sup>	NA	NA	NA	NA	NA	6.10E+00 <sup>b</sup>	1.80E-03 <sup>a</sup>	B1 <sup>a</sup>
CALCIUM CYANIDE	000592-01-8	4.00E-02 <sup>a</sup>	4.00E-02 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA

**SUMMARY OF REFERENCE DOSES (RfD), REFERENCE CONCENTRATIONS (RFC), SLOPE FACTORS ( $q^{-1}$ ),  
UNIT RISKS, AND EPA CANCER CLASSIFICATION FROM IRIS AND HEAST IN CHEMICAL ORDER**

Chemical	CAS Number	Oral RfD (mg/kg/day)		Oral Slope Factor (mg/kg/day) $^{-1}$	Oral Unit Risk (µg/L) $^{-1}$	Inhalation RFC (mg/m $^3$ )		Inhalation Slope Factor (mg/kg/day) $^{-1}$	Inhalation Unit Risk (µg/m $^3$ ) $^{-1}$	EPA Class
		Chronic	Subchronic			Chronic	Subchronic			
CAPROLACTAM	000105-60-2	5.00E-01 <sup>a</sup>	5.00E-01 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
CAPTAFOL	002425-06-1	2.00E-03 <sup>a</sup>	2.00E-03 <sup>b</sup>	8.60E-03 <sup>b</sup>	2.40E-07 <sup>b</sup>	NA	NA	NA	NA	C
CAPTAN	000133-06-2	1.30E-01 <sup>a</sup>	1.30E-01 <sup>b</sup>	3.50E-03 <sup>b</sup>	1.00E-07 <sup>b</sup>	NA	NA	NA	NA	B2
CARBARYL	000063-25-2	1.00E-01 <sup>a</sup>	1.00E-01 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
CARBAZOLE	000086-74-8	NA	NA	2.00E-02 <sup>b</sup>	5.70E-07 <sup>b</sup>	NA	NA	NA	NA	B2
CARBOFURAN	001563-66-2	5.00E-03 <sup>a</sup>	5.00E-03 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
CARBON DISULFIDE	000075-15-0	1.00E-01 <sup>a</sup>	1.00E-01 <sup>b</sup>	NA	NA	1.00E-02 <sup>b</sup>	1.00E-02 <sup>b</sup>	NA	NA	NA
CARBON TETRACHLORIDE	000056-23-5	7.00E-04 <sup>a</sup>	7.00E-03 <sup>b,e</sup>	1.30E-01 <sup>b</sup>	3.70E-06 <sup>a</sup>	NA	NA	5.30E-02 <sup>b</sup>	1.50E-05 <sup>a</sup>	B2
CARBOSULFAN	065285-14-8	1.00E-02 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
CARBOXIN	005234-68-4	1.00E-01 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
CHLORAL	000075-87-6	2.00E-03 <sup>a</sup>	2.00E-02 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
CHLORAMBEN	000133-80-4	1.50E-02 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
CHLORANIL	000118-75-2	NA	NA	4.03E-01 <sup>b</sup>	1.20E-05 <sup>b</sup>	NA	NA	NA	NA	C
CHLORDANE	000057-74-9	8.00E-05 <sup>a</sup>	8.00E-05 <sup>b,e</sup>	1.30E+00 <sup>b</sup>	3.70E-05 <sup>a</sup>	NA	NA	1.30E+00 <sup>b</sup>	3.70E-04 <sup>a</sup>	B2
CHLORIMURON-ETHYL	090982-32-4	2.00E-02 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
CHLORINE	007782-50-5	1.00E-01 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
CHLORINE DIOXIDE	010049-04-4	NA	NA	NA	NA	2.00E-04 <sup>a</sup>	NA	NA	NA	NA
CHLORO-1,3-BUTADIENE, 2-	000126-89-8	2.00E-02 <sup>b,c</sup>	2.00E-02 <sup>b,c</sup>	NA	NA	7.00E-03 <sup>b</sup>	7.00E-02 <sup>b</sup>	NA	NA	NA
CHLORO-2-METHYLANILINE HCl, 4-	003165-93-3	NA	NA	4.60E-01 <sup>b</sup>	1.30E-05 <sup>b</sup>	NA	NA	NA	NA	B2
CHLORO-2-METHYLANILINE, 4-	000095-69-2	NA	NA	5.80E-01 <sup>b</sup>	1.60E-05 <sup>b</sup>	NA	NA	NA	NA	B2
CHLOROACETIC ACID	000079-11-8	2.00E-03 <sup>b</sup>	2.00E-02 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
CHLOROACETOPHENONE, 2-	000532-27-4	NA	NA	NA	NA	3.00E-05 <sup>a</sup>	NA	NA	NA	NA
CHLOROANILINE, p-	000106-47-8	4.00E-03 <sup>a</sup>	4.00E-03 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
CHLOROBENZENE	000108-90-7	2.00E-02 <sup>a</sup>	2.00E-01 <sup>b,e</sup>	NA	NA	2.00E-02 <sup>b,c</sup>	NA <sup>e</sup>	NA	NA	D
CHLOROBENZILATE	000510-15-6	2.00E-02 <sup>a</sup>	2.00E-02 <sup>b</sup>	2.70E-01 <sup>b</sup>	7.80E-06 <sup>b</sup>	NA	NA	2.70E-01 <sup>b</sup>	7.80E-05 <sup>b</sup>	B2

**SUMMARY OF REFERENCE DOSES (RfD), REFERENCE CONCENTRATIONS (RfC), SLOPE FACTORS ( $q'$ ),  
UNIT RISKS, AND EPA CANCER CLASSIFICATION FROM IRIS AND HEAST IN CHEMICAL ORDER**

Chemical	CAS Number	Oral RfD (mg/kg/day)		Oral Slope Factor (mg/kg/day) <sup>-1</sup>	Oral Unit Risk (µg/L) <sup>-1</sup>	Inhalation RfC (mg/m <sup>3</sup> )		Inhalation Slope Factor (mg/kg/day) <sup>-1</sup>	Inhalation Unit Risk (µg/m <sup>3</sup> ) <sup>-1</sup>	EPA Class
		Chronic	Subchronic			Chronic	Subchronic			
CHLOROBENZOIC ACID, p-	000074-11-3	2.00E-01 <sup>b</sup>	2.00E+00 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
CHLOROBENZOTRIFLUORIDE, 4-	000098-56-6	2.00E-02 <sup>b</sup>	2.00E-01 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
CHLOROBUTANE, 1-	000109-69-3	4.00E-01 <sup>b</sup>	9.00E-01 <sup>b</sup>	NA	NA	NA	NA	NA	NA	D <sup>a</sup>
CHLOROBUTANE, 2-	000078-88-4	NA	NA	NA	NA	NA	NA	NA	NA	D <sup>a</sup>
CHLOROCYCLOPENTADIENE	041851-50-7	NA	NA	NA	NA	NA	NA	NA	NA	D <sup>a</sup>
CHLORODIBROMOETHANE	073508-84-2	NA	NA	8.40E-02 <sup>b</sup>	NA	NA	NA	NA	NA	NA
CHLORODIFLUOROMETHANE	000075-45-8	NA	NA	NA	NA	5.00E+01 <sup>a</sup>	NA	NA	NA	NA
CHLOROFORM	000067-66-3	1.00E-02 <sup>a</sup>	1.00E-02 <sup>b,e</sup>	6.10E-03 <sup>a</sup>	1.70E-07 <sup>a</sup>	NA	NA	8.10E-02 <sup>b</sup>	2.30E-05 <sup>a</sup>	B2 <sup>b</sup>
CHLOROMETHANE	000074-87-3	NA	NA <sup>a</sup>	1.30E-02 <sup>b</sup>	3.70E-07 <sup>b</sup>	NA	NA <sup>a</sup>	6.30E-03 <sup>b</sup>	1.80E-06 <sup>b</sup>	C <sup>b</sup>
CHLOROMETHYL METHYL ETHER	000107-30-2	NA	NA	NA	NA	NA	NA	NA	NA	A <sup>b</sup>
CHLORONAPHTHALENE, BETA-	000091-58-7	8.00E-02 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
CHLORONITROBENZENE, o-	000088-73-3	NA	NA	2.50E-02 <sup>b</sup>	7.10E-07 <sup>b</sup>	NA	NA	NA	NA	B2 <sup>b</sup>
CHLORONITROBENZENE, p-	000121-73-3	NA	NA	1.80E-02 <sup>b</sup>	5.10E-07 <sup>b</sup>	NA	NA	NA	NA	B2 <sup>b</sup>
CHLOROPHENOL, 2-	000095-57-8	5.00E-03 <sup>a</sup>	5.00E-02 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
CHLOROPHENYL METHYL SULFIDE, p-	000123-09-1	NA	NA	NA	NA	NA	NA	NA	NA	D <sup>a</sup>
CHLOROPHENYL METHYL SULFOXIDE	000934-73-6	NA	NA	NA	NA	NA	NA	NA	NA	D <sup>b</sup>
CHLOROPROPANE, 2-	000075-29-6	NA	NA	NA	NA	1.00E-01 <sup>b</sup>	1.00E+00 <sup>b</sup>	NA	NA	NA
CHLOROTHALONIL	001897-45-6	1.50E-02 <sup>a</sup>	1.50E-02 <sup>b</sup>	1.10E-02 <sup>b</sup>	3.10E-07 <sup>b</sup>	NA	NA	NA	NA	B2 <sup>b</sup>
CHLOROTOLUENE, o-	000095-49-8	2.00E-02 <sup>a</sup>	2.00E-01 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
CHLORPROPHAM	000101-21-3	2.00E-01 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
CHLORPYRIFOS	002821-88-2	3.00E-03 <sup>a</sup>	3.00E-03 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
CHLORPYRIFOS METHYL	005598-13-0	1.00E-02 <sup>b</sup>	1.00E-02 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
CHLORSULFURON	064902-72-3	5.00E-02 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
CHLORTHIOPHOS	060238-56-4	8.00E-04 <sup>b</sup>	8.00E-04 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
CHROMIUM (III) (INSOLUBLE SALTS)	016065-83-1	1.00E+00 <sup>a</sup>	1.00E+00 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA

**SUMMARY OF REFERENCE DOSES (RfD), REFERENCE CONCENTRATIONS (RfC), SLOPE FACTORS ( $q_1$ ),  
UNIT RISKS, AND EPA CANCER CLASSIFICATION FROM IRIS AND HEAST IN CHEMICAL ORDER**

Chemical	CAS Number	Oral RfD (mg/kg/day)		Oral Slope Factor (mg/kg/day) <sup>-1</sup>	Oral Unit Risk (µg/L) <sup>-1</sup>	Inhalation RfC (mg/m <sup>3</sup> )		Inhalation Slope Factor (mg/kg/day) <sup>-1</sup>	Inhalation Unit Risk (µg/m <sup>3</sup> ) <sup>-1</sup>	EPA Class
		Chronic	Subchronic			Chronic	Subchronic			
CHROMIUM (VI)	018540-29-9	5.00E-03 <sup>a</sup>	2.00E-02 <sup>b,e</sup>	NA	NA	NA	NA	4.10E+01 <sup>b</sup>	1.20E-02 <sup>a</sup>	A <sup>b</sup>
CHRYSENE	000218-01-9	NA	NA	NA	NA	NA	NA	NA	NA	B2 <sup>a</sup>
COKE OVEN EMISSIONS	008007-45-2	NA	NA	NA	NA	NA	NA	2.20E+00 <sup>b</sup>	6.20E-04 <sup>b</sup>	A <sup>a</sup>
COPPER	007440-50-6	NA	NA <sup>f</sup>	NA	NA	NA	NA <sup>f</sup>	NA	NA	D
COPPER CYANIDE	000544-92-3	5.00E-03 <sup>a</sup>	6.00E-02 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
CREOSOTE	008001-58-9	NA	NA	NA	NA	NA	NA	NA	NA	B1 <sup>a</sup>
CRESOL, m-	000106-39-4	5.00E-02 <sup>a</sup>	6.00E-01 <sup>b</sup>	NA	NA	NA	NA	NA	NA	C <sup>a</sup>
CRESOL, o-	000095-48-7	5.00E-02 <sup>a</sup>	5.00E-01 <sup>b</sup>	NA	NA	NA	NA	NA	NA	C <sup>a</sup>
CRESOL, p-	000106-44-5	5.00E-03 <sup>b</sup>	5.00E-03 <sup>b</sup>	NA	NA	NA	NA	NA	NA	C <sup>a</sup>
CROTONALDEHYDE	000123-73-9	NA	NA	1.90E+00 <sup>b</sup>	5.40E-05 <sup>b</sup>	NA	NA	NA	NA	C <sup>a</sup>
CUMENE	000086-82-8	4.00E-02 <sup>a</sup>	4.00E-01 <sup>b</sup>	NA	NA	9.00E-03 <sup>b</sup>	9.00E-02 <sup>b</sup>	NA	NA	NA
CYANAZINE	021725-46-2	2.00E-03 <sup>b</sup>	2.00E-03 <sup>b</sup>	8.40E-01 <sup>b</sup>	2.40E-05 <sup>b</sup>	NA	NA	NA	NA	C <sup>b</sup>
CYANIDE (CN-)	000057-12-5	2.00E-02 <sup>a</sup>	2.00E-02 <sup>b</sup>	NA	NA	NA	NA	NA	NA	D <sup>a</sup>
CYANOGEN	000480-19-5	4.00E-02 <sup>a</sup>	4.00E-02 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
CYANOGEN BROMIDE	000508-68-3	9.00E-02 <sup>a</sup>	9.00E-02 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
CYANOGEN CHLORIDE	000506-77-4	5.00E-02 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
CYCLOHEXANE, 1,2,3,4,5-PENTABROMO-6-CHLORO	000087-84-3	NA	NA	2.30E-02 <sup>b</sup>	8.60E-07 <sup>b</sup>	NA	NA	NA	NA	C <sup>b</sup>
CYCLOHEXANONE	000108-84-1	5.00E+00 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
CYCLOHEXYLAMINE	000108-81-8	2.00E-01 <sup>a</sup>	3.00E-01 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
CYCLOPENTADIENE	000542-92-7	NA	NA	NA	NA	NA	NA	3.00E+00 <sup>b,c</sup>	NA	NA
CYHALOTHrin/KARATE	068085-85-8	5.00E-03 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
CYPERMETHRIN	052315-07-8	1.00E-02 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
CYROMAZINE	066215-27-8	7.50E-03 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
DACTHAL	001881-32-1	1.00E-02 <sup>a</sup>	5.00E-01 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
DALAPON	000075-99-0	3.00E-02 <sup>a</sup>	3.00E-02 <sup>b</sup>	NA	NA	NA	NA	NA	NA	D <sup>a</sup>

**SUMMARY OF REFERENCE DOSES (RfD), REFERENCE CONCENTRATIONS (Rfc), SLOPE FACTORS ( $q$ <sup>-1</sup>),  
UNIT RISKS, AND EPA CANCER CLASSIFICATION FROM IRIS AND HEAST IN CHEMICAL ORDER**

Chemical	CAS Number	Oral RfD (mg/kg/day)		Oral Slope Factor (mg/kg/day) <sup>-1</sup>	Oral Unit Risk (µg/L) <sup>-1</sup>	Inhalation RIC (mg/m <sup>3</sup> )		Inhalation Slope Factor (mg/kg/day) <sup>-1</sup>	Inhalation Unit Risk (µg/m <sup>3</sup> ) <sup>-1</sup>	EPA Class
		Chronic	Subchronic			Chronic	Subchronic			
DDD	000072-54-8	NA	NA	2.40E-01 <sup>a</sup>	6.90E-06 <sup>a</sup>	NA	NA	NA	NA	B2 <sup>a</sup>
DDE	000072-55-9	NA	NA	3.40E-01 <sup>a</sup>	9.70E-06 <sup>a</sup>	NA	NA	NA	NA	B2 <sup>a</sup>
DDT	000050-29-3	5.00E-04 <sup>a</sup>	5.00E-04 <sup>b</sup>	3.40E-01 <sup>a</sup>	9.70E-06 <sup>a</sup>	NA	NA	3.40E-01 <sup>b</sup>	9.70E-05 <sup>a</sup>	B2 <sup>a</sup>
DECABROMODIPHENYL ETHER	001163-19-5	1.00E-02 <sup>b</sup>	1.00E-02 <sup>b</sup>	NA	NA	NA	NA	NA	NA	C <sup>b</sup>
DEMETON	008065-48-3	4.00E-05 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
DI(2-ETHYLHEXYL)ADIPATE	000103-23-1	NA	NA	1.20E-03 <sup>a</sup>	3.40E-08 <sup>a</sup>	NA	NA	NA	NA	C <sup>b</sup>
DIALLATE	002303-16-4	NA	NA	6.10E-02 <sup>b</sup>	1.70E-06 <sup>b</sup>	NA	NA	NA	NA	B2 <sup>b</sup>
DIAZINON	000333-41-5	9.00E-04 <sup>b</sup>	9.00E-04 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
DIBENZA(H)ANTHRACENE	000053-70-3	NA	NA	NA	NA	NA	NA	NA	NA	B2 <sup>a</sup>
DIBROMO-3-CHLOROPROPANE, 1,2-	000096-12-8	NA	NA	1.40E+00 <sup>b</sup>	4.00E-05 <sup>a</sup>	2.00E-04 <sup>a</sup>	NA	2.40E-03 <sup>b</sup>	8.90E-07 <sup>b</sup>	B2 <sup>b</sup>
DIBROMOBENZENE, 1,4-	000106-37-8	1.00E-02 <sup>a</sup>	1.00E-01 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
DIBROMOCHLOROMETHANE	000124-48-1	2.00E-02 <sup>a</sup>	2.00E-01 <sup>b</sup>	6.40E-02 <sup>a</sup>	2.40E-06 <sup>a</sup>	NA	NA	NA	NA	B2 <sup>a</sup>
DIBROMODICHLOROMETHANE	000594-18-3	NA	NA	NA	NA	NA	NA	NA	NA	D <sup>a</sup>
DIBROMODIPHENYL ETHER, p,p'	002050-47-7	NA	NA	NA	NA	NA	NA	NA	NA	D <sup>a</sup>
DIBROMOETHANE, 1,2-	000106-93-4	NA	NA	6.50E+01 <sup>a</sup>	2.50E-03 <sup>a</sup>	2.00E-04 <sup>b</sup>	2.00E-03 <sup>b</sup>	7.60E-01 <sup>b</sup>	2.20E-04 <sup>a</sup>	B2 <sup>a</sup>
DIBROMOMETHANE (METHYLENE BROMIDE)	000074-95-3	1.00E-02 <sup>b,c</sup>	1.00E-01 <sup>b,c</sup>	NA	NA	NA	NA	NA	NA	NA
DIBUTYL PHTHALATE	000084-74-2	1.00E-01 <sup>a</sup>	1.00E+00 <sup>b</sup>	NA	NA	NA	NA	NA	NA	D <sup>a</sup>
DICAMBA	001918-00-9	3.00E-02 <sup>a</sup>	3.00E-02 <sup>b</sup>	NA	NA	NA	NA	NA	NA	D <sup>a</sup>
DICHLORO-2-BUTENE, 1,4-	000764-41-0	NA	NA	NA	NA	NA	NA	NA	9.30E+00 <sup>b</sup>	2.60E-03 <sup>b</sup>
DICHLOROBENZENE, 1,2-	000095-50-1	9.00E-02 <sup>b</sup>	9.00E-01 <sup>b,e</sup>	NA	NA	2.00E-01 <sup>b,c</sup>	2.00E+00 <sup>b</sup>	NA	NA	D <sup>a</sup>
DICHLOROBENZENE, 1,3-	000541-73-1	NA	NA	NA	NA	NA	NA	NA	NA	D <sup>a</sup>
DICHLOROBENZENE, 1,4-	000106-46-7	NA	NA	2.40E-02 <sup>b</sup>	6.80E-07 <sup>b</sup>	8.00E-01 <sup>a</sup>	2.50E+00 <sup>b</sup>	NA	NA	B2 <sup>b</sup>
DICHLOROBENZIDINE, 3,3'-	000091-94-1	NA	NA	4.50E-01 <sup>a</sup>	1.30E-05 <sup>a</sup>	NA	NA	NA	NA	B2 <sup>a</sup>
DICHLORODIFLUOROMETHANE	000075-71-8	2.00E-01 <sup>b</sup>	9.00E-01 <sup>b</sup>	NA	NA	2.00E-01 <sup>b,c</sup>	2.00E+00 <sup>b,c</sup>	NA	NA	D <sup>a</sup>
DICHLOROETHANE, 1,1-	000075-34-3	1.00E-01 <sup>b</sup>	1.00E+00 <sup>b</sup>	NA	NA	5.00E-01 <sup>b,c</sup>	5.00E+00 <sup>b,c</sup>	NA	NA	C <sup>a</sup>

**SUMMARY OF REFERENCE DOSES (RfD), REFERENCE CONCENTRATIONS (RfC), SLOPE FACTORS ( $q^{-1}$ ),  
UNIT RISKS, AND EPA CANCER CLASSIFICATION FROM IRIS AND HEAST IN CHEMICAL ORDER**

Chemical	CAS Number	Oral RfD (mg/kg/day)		Oral Slope Factor (mg/kg/day) $^{-1}$	Oral Unit Risk (µg/L) $^{-1}$	Inhalation RfC (mg/m $^3$ )		Inhalation Slope Factor (mg/kg/day) $^{-1}$	Inhalation Unit Risk (µg/m $^3$ ) $^{-1}$	EPA Class
		Chronic	Subchronic			Chronic	Subchronic			
DICHLOROETHANE, 1,2-	000107-08-2	NA	NA <sup>e</sup>	9.10E-02 <sup>a</sup>	2.60E-06 <sup>a</sup>	NA	NA	9.10E-02 <sup>b</sup>	2.60E-05 <sup>a</sup>	B2 <sup>a</sup>
DICHLOROETHYLENE, 1,1-	000075-35-4	9.00E-03 <sup>a</sup>	9.00E-03 <sup>b</sup>	6.00E-01 <sup>a</sup>	1.70E-05 <sup>a</sup>	NA	NA	1.20E+00 <sup>b</sup>	5.00E-05 <sup>a</sup>	C <sup>a</sup>
DICHLOROETHYLENE, 1,2-, (MIXED ISOMERS)	000540-59-0	9.00E-03 <sup>b</sup>	9.00E-03 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
DICHLOROETHYLENE, 1,2-C-	000156-59-2	1.00E-02 <sup>b</sup>	1.00E-01 <sup>b</sup>	NA	NA	NA	NA	NA	NA	D <sup>a</sup>
DICHLOROETHYLENE, 1,2-T-	000156-60-5	2.00E-02 <sup>a</sup>	2.00E-01 <sup>b</sup>	NA	NA	NA	NA	NA	NA	D <sup>a</sup>
DICHLOROPHENOL, 2,4-	000120-83-2	3.00E-03 <sup>a</sup>	3.00E-03 <sup>b</sup>	NA	NA	NA	NA	NA	NA	D <sup>a</sup>
DICHLOROPHOXY ACETIC ACID, 2,4-	000094-75-7	1.00E-02 <sup>a</sup>	1.00E-02 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
DICHLOROPHOXYBUTYRIC ACID, 4-(2,4-	000094-82-8	8.00E-03 <sup>a</sup>	8.00E-02 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
DICHLOROPROPANE, 1,2-	000078-87-5	NA	NA	6.80E-02 <sup>b</sup>	1.80E-06 <sup>b</sup>	4.00E-03 <sup>a</sup>	1.30E-02 <sup>b</sup>	NA	NA	B2 <sup>a</sup>
DICHLOROPROPANOL, 2,3-	000818-23-9	3.00E-03 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
DICHLOROPROPENE, 1,3-	000542-75-8	3.00E-04 <sup>a</sup>	3.00E-03 <sup>b</sup>	1.80E-01 <sup>b</sup>	5.00E-06 <sup>b</sup>	2.00E-02 <sup>a</sup>	2.00E-02 <sup>b</sup>	1.30E-01 <sup>b</sup>	3.70E-05 <sup>b</sup>	B2 <sup>a</sup>
DICHLORVOS	000062-73-7	5.00E-04 <sup>a</sup>	NA	2.90E-01 <sup>a</sup>	8.30E-06 <sup>a</sup>	5.00E-04 <sup>a</sup>	NA	NA	NA	B2 <sup>a</sup>
DICOFOL	000115-32-2	NA	NA	NA	NA	NA	NA	NA	NA	D <sup>a</sup>
DICYCLOPENTADIENE	000077-73-6	3.00E-02 <sup>b</sup>	3.00E-01 <sup>b</sup>	NA	NA	2.00E-04 <sup>b,c</sup>	2.00E-03 <sup>b,c</sup>	NA	NA	NA
DIELDRIN	000080-57-1	5.00E-05 <sup>a</sup>	5.00E-06 <sup>b</sup>	1.60E+01 <sup>a</sup>	4.60E-04 <sup>a</sup>	NA	NA	1.60E+01 <sup>b</sup>	4.60E-03 <sup>a</sup>	B2 <sup>a</sup>
DIETHYL PHTHALATE	000084-66-2	8.00E-01 <sup>a</sup>	8.00E+00 <sup>b</sup>	NA	NA	NA	NA	NA	NA	D <sup>a</sup>
DIETHYL-P-NITROPHENYLPHOSPHATE	000311-45-5	NA	NA	NA	NA	NA	NA	NA	NA	D <sup>a</sup>
DIETHYLENE GLYCOL DINITRATE (DEGDN)	000693-21-0	NA	NA	NA	NA	NA	NA	NA	NA	D <sup>a</sup>
DIETHYLENE GLYCOL MONOBUTYL ETHER	000112-34-8	NA	NA	NA	NA	2.00E-02 <sup>b</sup>	2.00E-01 <sup>b</sup>	NA	NA	NA
DIETHYLENE GLYCOL MONOETHYL ETHER	000111-90-0	2.00E+00 <sup>b</sup>	5.00E+00 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
DIETHYLFORMAMIDE	000817-84-5	1.10E-02 <sup>b</sup>	1.10E-02 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
DIETHYLSTILBESTEROL	000056-53-1	NA	NA	4.70E+03 <sup>b</sup>	1.30E-01 <sup>b</sup>	NA	NA	4.90E+02 <sup>b</sup>	NA	A <sup>b</sup>
DIFENZOQUAT	043222-48-6	8.00E-02 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
DIFLUBENZURON	035367-38-5	2.00E-02 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
DIFLUOROETHANE, 1,1-	000075-37-6	NA	NA	NA	NA	4.00E+01 <sup>a</sup>	NA	NA	NA	NA

**SUMMARY OF REFERENCE DOSES (RfD), REFERENCE CONCENTRATIONS (RfC), SLOPE FACTORS ( $q^{-1}$ ),  
UNIT RISKS, AND EPA CANCER CLASSIFICATION FROM IRIS AND HEAST IN CHEMICAL ORDER**

Chemical	CAS Number	Oral RfD (mg/kg/day)		Oral Slope Factor (mg/kg/day) <sup>-1</sup>	Oral Unit Risk (µg/L) <sup>-1</sup>	Inhalation RfC (mg/m <sup>3</sup> )		Inhalation Slope Factor (mg/kg/day) <sup>-1</sup>	Inhalation Unit Risk (µg/m <sup>3</sup> ) <sup>-1</sup>	EPA Class
		Chronic	Subchronic			Chronic	Subchronic			
DIMISOPROPYL METHYLPHOSPHONATE	001445-75-8	8.00E-02 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	D <sup>a</sup>
DIMETHIPIN	055290-64-7	2.00E-02 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	C <sup>a</sup>
DIMETHOATE	000080-51-5	2.00E-04 <sup>a</sup>	2.00E-04 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA <sup>b</sup>
DIMETHOXYBENZIDINE, 3,3'-	000118-90-4	NA	NA	1.40E-02 <sup>b</sup>	4.00E-07 <sup>b</sup>	NA	NA	NA	NA	B2
DIMETHYL SULFATE	000077-78-1	NA	NA	NA	NA	NA	NA	NA	NA	B2 <sup>a</sup>
DIMETHYLANILINE HCl, 2,4-	021436-96-4	NA	NA	5.80E-01 <sup>b</sup>	1.70E-05 <sup>b</sup>	NA	NA	NA	NA	C <sup>b</sup>
DIMETHYLANILINE, 2,4-	000095-88-1	NA	NA	7.50E-01 <sup>b</sup>	2.10E-05 <sup>b</sup>	NA	NA	NA	NA	C <sup>b</sup>
DIMETHYLANILINE, N,N-	000121-89-7	2.00E-03 <sup>a</sup>	2.00E-02 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA <sup>b</sup>
DIMETHYLBENZIDINE, 3,3'-	000118-93-7	NA	NA	9.20E+00 <sup>b</sup>	2.60E-04 <sup>b</sup>	NA	NA	NA	NA	B2
DIMETHYLETHYL LEAD	107584-40-7	NA <sup>d</sup>	NA	NA	NA	NA	NA	NA	NA	NA
DIMETHYLFORMAMIDE	000068-12-2	1.00E-01 <sup>b</sup>	1.00E+00 <sup>b</sup>	NA	NA	3.00E-02 <sup>a</sup>	3.00E-02 <sup>b</sup>	NA	NA	NA
DIMETHYLHYDRAZINE, 1,2-	000540-73-8	NA	NA	NA <sup>e</sup>	NA <sup>e</sup>	NA	NA	NA <sup>e</sup>	NA <sup>e</sup>	B2 <sup>b</sup>
DIMETHYLPHENOL, 2,4-	000105-67-8	2.00E-02 <sup>a</sup>	2.00E-01 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
DIMETHYLPHENOL, 2,6-	000576-26-1	6.00E-04 <sup>a</sup>	6.00E-03 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
DIMETHYLPHENOL, 3,4-	000095-65-8	1.00E-03 <sup>a</sup>	1.00E-02 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
DIMETHYLPHthalate	000131-11-3	NA	NA	NA	NA	NA	NA	NA	NA	D <sup>b</sup>
DIMETHYLTEREPHTHALATE	000120-61-6	1.00E-01 <sup>a</sup>	1.00E-01 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
DINITRO-O-CYCLOHEXYL PHENOL, 4,6-	000131-89-5	2.00E-03 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
DINITROBENZENE, 1,2-	000526-29-0	4.00E-04 <sup>b</sup>	4.00E-03 <sup>b</sup>	NA	NA	NA	NA	NA	NA	D <sup>a</sup>
DINITROBENZENE, 1,3-	000099-85-0	1.00E-04 <sup>a</sup>	1.00E-03 <sup>b</sup>	NA	NA	NA	NA	NA	NA	D <sup>a</sup>
DINITROBENZENE, 1,4-	000100-25-4	4.00E-04 <sup>b</sup>	4.00E-03 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
DINITROPHENOL, 2,4-	000051-28-5	2.00E-03 <sup>a</sup>	2.00E-03 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
DINITROTOLUENE, 2,4-	000121-14-2	2.00E-03 <sup>a</sup>	2.00E-03 <sup>b</sup>	6.80E-01 <sup>a,g</sup>	1.80E-05 <sup>a</sup>	NA	NA	NA	NA	B2
DINITROTOLUENE, 2,6-	000606-20-2	1.00E-03 <sup>b</sup>	1.00E-02 <sup>b</sup>	6.80E-01 <sup>a,g</sup>	1.90E-05 <sup>a</sup>	NA	NA	NA	NA	B2 <sup>a</sup>
DINOSEB	000088-85-7	1.00E-03 <sup>a</sup>	1.00E-03 <sup>b</sup>	NA	NA	NA	NA	NA	NA	D <sup>a</sup>

**SUMMARY OF REFERENCE DOSES (RfD), REFERENCE CONCENTRATIONS (RfC), SLOPE FACTORS ( $\text{q}^{-1}$ ),  
UNIT RISKS, AND EPA CANCER CLASSIFICATION FROM IRIS AND HEAST IN CHEMICAL ORDER**

Chemical	CAS Number	Oral RfD (mg/kg/day)		Oral Slope Factor (mg/kg/day) <sup>-1</sup>	Oral Unit Risk ( $\mu\text{g}/\text{L}$ ) <sup>-1</sup>	Inhalation RfC (mg/m <sup>3</sup> )		Inhalation Slope Factor (mg/kg/day) <sup>-1</sup>	Inhalation Unit Risk ( $\mu\text{g}/\text{m}^3$ ) <sup>-1</sup>	EPA Class
		Chronic	Subchronic			Chronic	Subchronic			
DIOXANE, 1,4-	000123-91-1	NA	NA	1.10E-02 <sup>a</sup>	3.10E-07 <sup>a</sup>	NA	NA	NA	NA	B2 <sup>a</sup>
DIPHENAMID	000957-51-7	3.00E-02 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	D <sup>a</sup>
DIPHENYLAMINE	000122-39-4	2.50E-02 <sup>a</sup>	2.50E-02 <sup>b</sup>	NA	NA	NA	NA	NA	NA	D <sup>a</sup>
DIPHENYLHYDRAZINE, 1,2-	000122-66-7	NA	NA	8.00E-01 <sup>a</sup>	2.20E-05 <sup>a</sup>	NA	NA	8.00E-01 <sup>b</sup>	2.20E-04 <sup>a</sup>	B2 <sup>a</sup>
DIQUAT	000085-00-7	2.20E-03 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	D <sup>a</sup>
DIRECT BLACK 38	001937-37-7	NA	NA	8.60E+00 <sup>b</sup>	2.40E-04 <sup>b</sup>	NA	NA	NA	NA	A <sup>b</sup>
DIRECT BLUE 6	002602-46-2	NA	NA	8.10E+00 <sup>b</sup>	2.30E-04 <sup>b</sup>	NA	NA	NA	NA	A <sup>b</sup>
DIRECT BROWN 95	016071-86-6	NA	NA	9.30E+00 <sup>b</sup>	2.60E-04 <sup>b</sup>	NA	NA	NA	NA	A <sup>b</sup>
DIRECT SKY BLUE	002610-05-1	NA	NA	NA	NA	NA	NA	NA	NA	B2 <sup>b</sup>
DISULFOTON	000298-04-4	4.00E-05 <sup>a</sup>	4.00E-05 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
DIURON	000330-54-1	2.00E-03 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	D <sup>a</sup>
DODINE	002438-10-3	4.00E-03 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
ENDOSULFAN	000115-29-7	6.00E-03 <sup>a</sup>	6.00E-03 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
ENDOTHALL	000145-73-3	2.00E-02 <sup>a</sup>	2.00E-02 <sup>b</sup>	NA	NA	NA	NA	NA	NA	D <sup>a</sup>
ENDRIN	000072-20-8	3.00E-04 <sup>a</sup>	3.00E-04 <sup>b</sup>	NA	NA	NA	NA	NA	NA	D <sup>a</sup>
EPICHLOROHYDRIN	000106-89-8	2.00E-03 <sup>b</sup>	2.00E-03 <sup>b</sup>	9.90E-03 <sup>a</sup>	2.80E-07 <sup>a</sup>	1.00E-03 <sup>a</sup>	1.00E-02 <sup>b</sup>	4.20E-03 <sup>b</sup>	1.20E-06 <sup>a</sup>	B2 <sup>a</sup>
EPOXYBUTANE, 1,2-	000106-88-7	NA	NA	NA	NA	2.00E-02 <sup>a</sup>	NA	NA	NA	NA
EPTC	000759-84-4	2.50E-02 <sup>a</sup>	2.50E-02 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
ETHEPHON	016672-87-0	5.00E-03 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
ETHION	000563-12-2	5.00E-04 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
ETHOXYETHANOL ACETATE, 2-	000111-15-9	3.00E-01 <sup>b,c</sup>	3.00E-01 <sup>b,c</sup>	NA	NA	NA	NA	NA	NA	NA
ETHOXYETHANOL, 2-	000110-80-5	4.00E-01 <sup>b</sup>	5.00E-01 <sup>b</sup>	NA	NA	2.00E-01 <sup>a</sup>	2.00E+00 <sup>b</sup>	NA	NA	NA
ETHYL ACETATE	000141-78-6	9.00E-01 <sup>a</sup>	9.00E+00 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
ETHYL ACRYLATE	000140-88-5	NA	NA	4.80E-02 <sup>b</sup>	1.40E-06 <sup>b</sup>	NA	NA	NA	NA	B2 <sup>b</sup>
ETHYL CHLORIDE	000075-00-3	NA	NA	NA	NA	1.00E+01 <sup>a</sup>	1.00E+01 <sup>b</sup>	NA	NA	NA

**SUMMARY OF REFERENCE DOSES (RfD), REFERENCE CONCENTRATIONS (RfC), SLOPE FACTORS ( $q_1$ ),  
UNIT RISKS, AND EPA CANCER CLASSIFICATION FROM IRIS AND HEAST IN CHEMICAL ORDER**

Chemical	CAS Number	Oral RfD (mg/kg/day)		Oral Slope Factor (mg/kg/day) <sup>-1</sup>	Oral Unit Risk (µg/L) <sup>-1</sup>	Inhalation RfC (mg/m <sup>3</sup> )		Inhalation Slope Factor (mg/kg/day) <sup>-1</sup>	Inhalation Unit Risk (µg/m <sup>3</sup> ) <sup>-1</sup>	EPA Class
		Chronic	Subchronic			Chronic	Subchronic			
ETHYL ETHER	000060-29-7	2.00E-01 <sup>a</sup>	2.00E+00 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
ETHYL METHACRYLATE	000097-63-2	9.00E-02 <sup>b</sup>	9.00E-02 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
ETHYL-p-NITROPHENYL PHOSPHONATE	002104-64-5	1.00E-05 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
ETHYLBENZENE	000100-41-4	1.00E-01 <sup>a</sup>	NA <sup>e</sup>	NA	NA	1.00E+00 <sup>a</sup>	NA <sup>e</sup>	NA	NA	D <sup>a</sup>
ETHYLENE CYANOHYDRIN	000109-78-4	3.00E-01 <sup>b</sup>	3.00E-01 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
ETHYLENE DIAMINE	000107-15-3	2.00E-02 <sup>b</sup>	2.00E-01 <sup>b</sup>	NA	NA	NA	NA	NA	NA	D <sup>a</sup>
ETHYLENE GLYCOL	000107-21-1	2.00E+00 <sup>a</sup>	2.00E+00 <sup>b</sup>	NA	NA	NA	NA	NA	NA	D <sup>b</sup>
ETHYLENE GLYCOL MONOBUTYLETHER	000111-76-2	NA	NA	NA	NA	2.00E-02 <sup>b</sup>	2.00E-01 <sup>b</sup>	NA	NA	NA
ETHYLENE OXIDE	000075-21-8	NA	NA	1.02E+00 <sup>b</sup>	2.90E-05 <sup>b</sup>	NA	NA	3.50E-01 <sup>b</sup>	1.00E-04 <sup>b</sup>	B1 <sup>b</sup>
ETHYLENE THIOUREA	000096-45-7	8.00E-05 <sup>a</sup>	8.00E-05 <sup>b</sup>	1.10E-01 <sup>b</sup>	3.40E-06 <sup>b</sup>	NA	NA	NA	NA	B2 <sup>b</sup>
ETHYLPHthalyl ETHYL GLYCOLATE	000084-72-0	3.00E+00 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
EXPRESS	101200-48-0	8.00E-03 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA	NA
FENAMIPHOS	022224-82-6	2.50E-04 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	D <sup>a</sup>
FENPROPATHRIN	039515-41-8	2.50E-02 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
FLUOMETURON	002164-17-2	1.30E-02 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	D <sup>a</sup>
FLUORANTHENE	000206-44-0	4.00E-02 <sup>a</sup>	4.00E-01 <sup>b</sup>	NA	NA	NA	NA	NA	NA	D <sup>a</sup>
FLUORENE	000086-73-7	4.00E-02 <sup>a</sup>	4.00E-01 <sup>b</sup>	NA	NA	NA	NA	NA	NA	D <sup>a</sup>
FLUORIDE	007782-41-4	8.00E-02 <sup>a</sup>	8.00E-02 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
FLURIDONE	059756-60-4	8.00E-02 <sup>a</sup>	8.00E-02 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
FLURPRIMIDOL	056425-91-3	2.00E-02 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
FLUTOLANIL	066332-96-5	6.00E-02 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
FLUVALINATE	069409-94-5	1.00E-02 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
FOLPET	000133-07-3	1.00E-01 <sup>a</sup>	1.00E-01 <sup>b</sup>	3.50E-03 <sup>a</sup>	1.00E-07 <sup>a</sup>	NA	NA	NA	NA	B2 <sup>a</sup>
FOMESAFEN	072178-02-0	NA	NA	1.90E-01 <sup>b</sup>	5.40E-06 <sup>a</sup>	NA	NA	NA	NA	C <sup>a</sup>
FONOFOSS	000944-22-9	2.00E-03 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	D <sup>a</sup>

**SUMMARY OF REFERENCE DOSES (RfD), REFERENCE CONCENTRATIONS (RFC), SLOPE FACTORS ( $q^{-1}$ ),  
UNIT RISKS, AND EPA CANCER CLASSIFICATION FROM IRIS AND HEAST IN CHEMICAL ORDER**

Chemical	CAS Number	Oral RfD (mg/kg/day)		Oral Slope Factor (mg/kg/day) <sup>-1</sup>	Oral Unit Risk (µg/L) <sup>-1</sup>	Inhalation RFC (mg/m <sup>3</sup> )		Inhalation Slope Factor (mg/kg/day) <sup>-1</sup>	Inhalation Unit Risk (µg/m <sup>3</sup> ) <sup>-1</sup>	EPA Class
		Chronic	Subchronic			Chronic	Subchronic			
FORMALDEHYDE	000050-00-0	2.00E-01 <sup>a</sup>	2.00E-01 <sup>b</sup>	NA	NA	NA	NA	4.50E-02 <sup>b</sup>	1.30E-05 <sup>a</sup>	B1 <sup>a</sup>
FORMIC ACID	000064-18-6	2.00E+00 <sup>b</sup>	2.00E+00 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
FOSETYL-AL	039148-24-8	3.00E+00 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA	C <sup>b</sup>
FURAN	000110-00-0	1.00E-03 <sup>a</sup>	1.00E-02 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
FURAZOLIDONE	000067-45-8	NA	NA	3.80E+00 <sup>b</sup>	1.00E-04 <sup>b</sup>	NA	NA	NA	NA	B2
FURFURAL	000098-01-1	3.00E-03 <sup>a</sup>	3.00E-02 <sup>b</sup>	NA	NA	5.00E-02 <sup>b,c</sup>	5.00E-01 <sup>b,c</sup>	NA	NA	NA
FURIUM	000531-82-8	NA	NA	5.00E+01 <sup>b</sup>	1.40E-03 <sup>b</sup>	NA	NA	NA	NA	B2
FURMECYCLOX	060568-05-0	NA	NA	3.00E-02 <sup>a</sup>	8.80E-07 <sup>a</sup>	NA	NA	NA	NA	B2 <sup>a</sup>
GLUFOSINATE-AMMONIUM	077182-82-2	4.00E-04 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
GLYCIDYL	000765-34-4	4.00E-04 <sup>a</sup>	4.00E-03 <sup>b</sup>	NA	NA	1.00E-03 <sup>b</sup>	1.00E-02 <sup>b</sup>	NA	NA	B2 <sup>a</sup>
GLYPHOSATE	001071-83-6	1.00E-01 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	D <sup>a</sup>
GOAL	042874-03-3	3.00E-03 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
HALOXYFOP-METHYL	069806-40-2	5.00E-05 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
HARMONY	079277-27-3	1.30E-02 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
HEPTACHLOR	000076-44-8	5.00E-04 <sup>a</sup>	5.00E-04 <sup>b</sup>	4.50E+00 <sup>a</sup>	1.30E-04 <sup>a</sup>	NA	NA	4.50E+00 <sup>b</sup>	1.30E-03 <sup>a</sup>	B2 <sup>a</sup>
HEPTACHLOR EPOXIDE	001024-57-3	1.30E-05 <sup>a</sup>	1.30E-05 <sup>b</sup>	9.10E+00 <sup>a</sup>	2.60E-04 <sup>a</sup>	NA	NA	9.10E+00 <sup>b</sup>	2.60E-03 <sup>a</sup>	B2 <sup>a</sup>
HEPTANE, N-	000142-82-5	NA	NA	NA	NA	NA	NA	NA	NA	D <sup>a</sup>
HEXBROMOBENZENE	000087-82-1	2.00E-03 <sup>a</sup>	2.00E-02 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
HEXACHLOROBENZENE	000118-74-1	8.00E-04 <sup>a</sup>	NA <sup>a</sup>	1.60E+00 <sup>a</sup>	4.80E-05 <sup>a</sup>	NA	NA	1.60E-00 <sup>b</sup>	4.80E-04 <sup>a</sup>	B2 <sup>a</sup>
HEXACHLOROBUTADIENE	000087-68-3	2.00E-04 <sup>b</sup>	NA <sup>a</sup>	7.80E-02 <sup>a</sup>	2.20E-06 <sup>a</sup>	NA	NA	7.80E-02 <sup>b</sup>	2.20E-05 <sup>a</sup>	C
HEXACHLOROCYCLOHEXANE, ALPHA-	000319-84-6	NA	NA	6.30E+00 <sup>a</sup>	1.80E-04 <sup>a</sup>	NA	NA	6.30E+00 <sup>b</sup>	1.80E-03 <sup>a</sup>	B2 <sup>a</sup>
HEXACHLOROCYCLOHEXANE, BETA-	000319-85-7	NA	NA	1.80E+00 <sup>a</sup>	5.30E-05 <sup>a</sup>	NA	NA	1.80E+00 <sup>b</sup>	5.30E-04 <sup>a</sup>	C <sup>a</sup>
HEXACHLOROCYCLOHEXANE, DELTA-	000319-86-8	NA	NA	NA	NA	NA	NA	NA	NA	D
HEXACHLOROCYCLOHEXANE, EPSILON	006108-10-7	NA	NA	NA	NA	NA	NA	NA	NA	D <sup>a</sup>
HEXACHLOROCYCLOHEXANE, GAMMA-	000058-89-9	3.00E-04 <sup>a</sup>	3.00E-03 <sup>b</sup>	1.30E+00 <sup>b</sup>	3.70E-05 <sup>b</sup>	NA	NA	NA	NA	B2 <sup>b</sup>

**SUMMARY OF REFERENCE DOSES (RfD), REFERENCE CONCENTRATIONS (RfC), SLOPE FACTORS ( $q_1$ ),  
UNIT RISKS, AND EPA CANCER CLASSIFICATION FROM IRIS AND HEAST IN CHEMICAL ORDER**

Chemical	CAS Number	Oral RfD (mg/kg/day)		Oral Slope Factor (mg/kg/day) <sup>-1</sup>	Oral Unit Risk (µg/L) <sup>-1</sup>	Inhalation RfC (mg/m <sup>3</sup> )		Inhalation Slope Factor (mg/kg/day) <sup>-1</sup>	Inhalation Unit Risk (µg/m <sup>3</sup> ) <sup>-1</sup>	EPA Class
		Chronic	Subchronic			Chronic	Subchronic			
HEXACHLOROCYCLOHEXANE, TECHNICAL	000608-73-1	NA	NA	1.80E+00 <sup>a</sup>	5.10E-05 <sup>a</sup>	NA	NA	1.80E+00 <sup>b</sup>	5.10E-04 <sup>a</sup>	B2 <sup>a</sup>
HEXACHLOROCYCLOPENTADIENE	000077-47-4	7.00E-03 <sup>a</sup>	7.00E-02 <sup>b</sup>	NA	NA	7.00E-05 <sup>b</sup>	7.00E-04 <sup>b</sup>	NA	NA	D <sup>a</sup>
HEXACHLORODIBENZO-p-DIOXIN, MIXTURE	019408-74-3	NA	NA	6.20E+03 <sup>a</sup>	1.80E-01 <sup>a</sup>	NA	NA	NA	1.30E+00 <sup>a</sup>	B2 <sup>a</sup>
HEXACHLOROETHANE	000067-72-1	1.00E-03 <sup>a</sup>	1.00E-02 <sup>b</sup>	1.40E-02 <sup>a</sup>	4.00E-07 <sup>a</sup>	NA	NA	1.40E-02 <sup>b</sup>	4.00E-06 <sup>a</sup>	C <sup>a</sup>
HEXACHLOROPHENONE	000070-30-4	3.00E-04 <sup>a</sup>	3.00E-03 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE (RDX)	000121-82-4	3.00E-03 <sup>a</sup>	3.00E-03 <sup>b</sup>	1.10E-01 <sup>a</sup>	3.10E-06 <sup>a</sup>	NA	NA	NA	NA	C <sup>a</sup>
HEXAMETHYLENE DIISOCYANATE, 1,6-	000822-06-0	NA	NA	NA	NA	1.00E-05 <sup>a</sup>	NA	NA	NA	NA
HEXANE, N-	000110-54-3	6.00E-02 <sup>b</sup>	6.00E-01 <sup>b</sup>	NA	NA	2.00E-01 <sup>a</sup>	2.00E-01 <sup>b</sup>	NA	NA	D <sup>a</sup>
HEXAZINONE	051235-04-2	3.30E-02 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	D <sup>a</sup>
HYDRAZINE	000302-01-2	NA	NA	3.00E+00 <sup>a</sup>	8.50E-05 <sup>a</sup>	NA	NA	1.70E+01 <sup>b</sup>	4.90E-03 <sup>a</sup>	B2 <sup>a</sup>
HYDRAZINE SULFATE	010034-93-2	NA	NA	3.00E+00 <sup>a</sup>	8.50E-05 <sup>a</sup>	NA	NA	1.70E+01 <sup>b</sup>	4.90E-03 <sup>a</sup>	B2 <sup>a</sup>
HYDROGEN CHLORIDE	007647-01-0	NA	NA	NA	NA	7.00E-03 <sup>a</sup>	NA	NA	NA	NA
HYDROGEN CYANIDE	000074-90-8	2.00E-02 <sup>a</sup>	NA	NA	NA	3.00E-03 <sup>a</sup>	NA	NA	NA	NA
HYDROGEN SULFIDE	007783-06-4	3.00E-03 <sup>a</sup>	3.00E-02 <sup>b</sup>	NA	NA	9.00E-04 <sup>a</sup>	9.00E-03 <sup>b</sup>	NA	NA	NA
HYDROQUINONE	000123-31-8	4.00E-02 <sup>b</sup>	4.00E-01 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
IMAZALIL	035554-44-0	1.30E-02 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
IMAZAQUIN	081335-37-7	2.50E-01 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
INDENO[1,2,3-cd]PYRENE	000193-39-5	NA	NA	NA	NA	NA	NA	NA	NA	B2 <sup>a</sup>
IPRODIONE	036734-19-7	4.00E-02 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
ISOBUTYL ALCOHOL	000078-83-1	3.00E-01 <sup>a</sup>	3.00E+00 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
ISOPHORONE	000078-59-1	2.00E-01 <sup>a</sup>	2.00E+00 <sup>b</sup>	9.50E-04 <sup>a</sup>	2.70E-08 <sup>a</sup>	NA	NA	NA	NA	C <sup>b</sup>
ISOPROPALIN	033820-53-0	1.50E-02 <sup>a</sup>	1.50E-01 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
ISOPROPYL METHYL PHOSPHONIC ACID	001832-54-8	1.00E-01 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	D <sup>a</sup>
ISOXABEN	082558-50-7	5.00E-02 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	C <sup>a</sup>
KARATE	091465-08-6	5.00E-03 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA

**SUMMARY OF REFERENCE DOSES (RfD), REFERENCE CONCENTRATIONS (RfC), SLOPE FACTORS ( $q_1$ ),  
UNIT RISKS, AND EPA CANCER CLASSIFICATION FROM IRIS AND HEAST IN CHEMICAL ORDER**

Chemical	CAS Number	Oral RfD (mg/kg/day)		Oral Slope Factor (mg/kg/day) <sup>-1</sup>	Oral Unit Risk (µg/L) <sup>-1</sup>	Inhalation RfC (mg/m <sup>3</sup> )		Inhalation Slope Factor (mg/kg/day) <sup>-1</sup>	Inhalation Unit Risk (µg/m <sup>3</sup> ) <sup>-1</sup>	EPA Class
		Chronic	Subchronic			Chronic	Subchronic			
KERB	023950-58-5	7.50E-02 <sup>a</sup>	7.50E-02 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
LACTOFEN	077501-63-4	2.00E-03 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA	NA
LEAD ALKYLs	NA	NA <sup>d</sup>	NA	NA	NA	NA	NA	NA	NA	NA
LEAD AND COMPOUNDS	007439-92-1	NA	NA	NA	NA	NA	NA	NA	NA	B2 <sup>a</sup>
LINURON	000330-55-2	2.00E-03 <sup>a</sup>	2.00E-03 <sup>b</sup>	NA	NA	NA	NA	NA	NA	C <sup>a</sup>
LONDAX	083055-99-8	2.00E-01 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
MALATHION	000121-75-5	2.00E-02 <sup>a</sup>	2.00E-02 <sup>b</sup>	NA	NA	NA	NA	NA	NA	D <sup>a</sup>
MALEIC ANHYDRIDE	000106-31-6	1.00E-01 <sup>a</sup>	1.00E-01 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
MALEIC HYDRAZIDE	000123-33-1	5.00E-01 <sup>a</sup>	5.00E-01 <sup>b</sup>	NA	NA	NA	NA	NA	NA	D <sup>a</sup>
MALONONITRILE	000109-77-3	2.00E-05 <sup>b</sup>	2.00E-04 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
MANCOZEB	008018-01-7	3.00E-02 <sup>b</sup>	3.00E-02 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
MANEB	012427-38-2	5.00E-03 <sup>a</sup>	5.00E-02 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
MANGANESE (Diet)	007439-96-5	1.40E-01 <sup>a</sup>	1.40E-01 <sup>b</sup>	NA	NA	5.00E-05 <sup>a</sup>	NA	NA	NA	D <sup>a</sup>
MANGANESE (Water)	007439-96-5	5.00E-03 <sup>a</sup>	5.00E-03 <sup>b</sup>	NA	NA	5.00E-05 <sup>a</sup>	NA	NA	NA	D <sup>a</sup>
MCPA	000094-74-6	5.00E-04 <sup>a</sup>	5.00E-04 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
MCPB	000094-81-5	1.00E-02 <sup>a</sup>	1.00E-01 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
MCPP	000093-65-2	1.00E-03 <sup>a</sup>	1.00E-02 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
MEPHOSFOLAN	000950-10-7	9.00E-05 <sup>b</sup>	9.00E-04 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
MEPIQUAT CHLORIDE	024307-26-4	3.00E-02 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
MERCURY, INORGANIC	007439-97-6	3.00E-04 <sup>b</sup>	3.00E-04 <sup>b</sup>	NA	NA	3.00E-04 <sup>b</sup>	3.00E-04 <sup>b</sup>	NA	NA	D <sup>a</sup>
MERPHOS	000150-50-5	3.00E-05 <sup>a</sup>	3.00E-04 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
MERPHOS OXIDE	000078-48-8	3.00E-05 <sup>a</sup>	3.00E-04 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
METALAXYL	057837-19-1	6.00E-02 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
METHACRYLONITRILE	000126-98-7	1.00E-04 <sup>a</sup>	1.00E-03 <sup>b</sup>	NA	NA	7.00E-04 <sup>b,c</sup>	7.00E-03 <sup>b,c</sup>	NA	NA	NA
METHAMIDOPHOS	010265-92-6	5.00E-05 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA	NA

**SUMMARY OF REFERENCE DOSES (RfD), REFERENCE CONCENTRATIONS (RfC), SLOPE FACTORS ( $q_{\text{1}}$ ),  
UNIT RISKS, AND EPA CANCER CLASSIFICATION FROM IRIS AND HEAST IN CHEMICAL ORDER**

Chemical	CAS Number	Oral RfD (mg/kg/day)		Oral Slope Factor (mg/kg/day) <sup>-1</sup>	Oral Unit Risk (µg/L) <sup>-1</sup>	Inhalation RfC (mg/m <sup>3</sup> )		Inhalation Slope Factor (mg/kg/day) <sup>-1</sup>	Inhalation Unit Risk (µg/m <sup>3</sup> ) <sup>-1</sup>	EPA Class
		Chronic	Subchronic			Chronic	Subchronic			
METHANOL	000067-56-1	5.00E-01 <sup>a</sup>	5.00E+00 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
METHIDATHION	000950-37-8	1.00E-03 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	C <sup>b</sup>
METHOMYL	016752-77-5	2.50E-02 <sup>a</sup>	2.50E-02 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
METHOXY-5-NITROANILINE, 2-	000099-59-2	NA	NA	4.60E-02 <sup>b</sup>	1.30E-06 <sup>b</sup>	NA	NA	NA	NA	B2 <sup>b</sup>
METHOXYCHLOR	000072-43-5	5.00E-03 <sup>a</sup>	5.00E-03 <sup>b</sup>	NA	NA	NA	NA	NA	NA	D <sup>a</sup>
METHOXYETHANOL ACETATE, 2-	000110-49-6	2.00E-03 <sup>b,c</sup>	2.00E-02 <sup>b,c</sup>	NA	NA	NA	NA	NA	NA	NA
METHOXYETHANOL, 2-	000109-86-4	1.00E-03 <sup>b,c</sup>	1.00E-02 <sup>b,c</sup>	NA	NA	2.00E-02 <sup>a</sup>	2.00E-01 <sup>b</sup>	NA	NA	NA
METHYL ACETATE	000079-20-9	1.00E+00 <sup>b</sup>	1.00E+01 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
METHYL ACRYLATE	000008-33-3	3.00E-02 <sup>b,c</sup>	3.00E-02 <sup>b,c</sup>	NA	NA	NA	NA	NA	NA	D <sup>a</sup>
METHYL ETHYL KETONE	000078-93-3	6.00E-01 <sup>a</sup>	2.00E+00 <sup>b</sup>	NA	NA	1.00E+00 <sup>a</sup>	1.00E+00 <sup>b</sup>	NA	NA	D <sup>a</sup>
METHYL ISOBUTYL KETONE	000108-10-1	8.00E-02 <sup>b</sup>	8.00E-01 <sup>b</sup>	NA	NA	8.00E-02 <sup>b,c</sup>	8.00E-01 <sup>b,c</sup>	NA	NA	NA
METHYL MERCURY	022987-92-6	3.00E-04 <sup>a</sup>	3.00E-04 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
METHYL METHACRYLATE	000080-62-6	8.00E-02 <sup>b</sup>	8.00E-02 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
METHYL PARATHION	000298-00-0	2.50E-04 <sup>a</sup>	2.00E-03 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
METHYL STYRENE (MIXED ISOMERS)	025013-15-4	8.00E-03 <sup>b,c</sup>	6.00E-03 <sup>b,c</sup>	NA	NA	4.00E-02 <sup>b,c</sup>	4.00E-02 <sup>b,c</sup>	NA	NA	NA
METHYL TERT-BUTYL ETHER (MTBE)	001634-04-4	NA	NA	NA	NA	3.00E+00 <sup>b</sup>	NA	NA	NA	NA
METHYL-5-NITROANILINE, 2-	000099-55-8	NA	NA	3.30E-02 <sup>b</sup>	9.40E-07 <sup>b</sup>	NA	NA	NA	NA	C <sup>b</sup>
METHYLANILINE HYDROCHLORIDE, 2-	000636-21-5	NA	NA	1.80E-01 <sup>b</sup>	5.10E-06 <sup>b</sup>	NA	NA	NA	NA	B2 <sup>b</sup>
METHYLCYCLOHEXANE	000108-67-2	NA	NA	NA	NA	3.00E+00 <sup>b</sup>	3.00E+00 <sup>b</sup>	NA	NA	NA
METHYLENE CHLORIDE	000075-09-2	6.00E-02 <sup>a</sup>	6.00E-02 <sup>b</sup>	7.50E-03 <sup>a</sup>	2.10E-07 <sup>a</sup>	3.00E+00 <sup>b</sup>	3.00E+00 <sup>b</sup>	NA	4.70E-07 <sup>a</sup>	B2 <sup>a</sup>
METHYLENE-BIS(2-CHLOROANILINE), 4,4'-	000101-14-4	7.00E-04 <sup>b</sup>	7.00E-04 <sup>b</sup>	1.30E-01 <sup>b</sup>	3.70E-06 <sup>b</sup>	NA	NA	1.30E-01 <sup>b</sup>	3.70E-05 <sup>b</sup>	B2 <sup>b</sup>
METHYLENE-BIS(N,N-DIMETHYL) ANILINE, 4,4'-	000101-61-1	NA	NA	4.80E-02 <sup>a</sup>	1.30E-06 <sup>a</sup>	NA	NA	NA	NA	B2 <sup>a</sup>
METHYLENEBISBENZENAMINE, 4,4'-	000101-77-9	NA	NA	NA	NA	NA	NA	NA	NA	NA
METHYLENEDIPHENYL ISOCYANATE, 4,4'-	000101-68-8	NA	NA	NA	NA	2.00E-05 <sup>a</sup>	2.00E-05 <sup>b</sup>	NA	NA	NA
METHYLSTYRENE, ALPHA-	000098-83-9	7.00E-02 <sup>b,c</sup>	7.00E-01 <sup>b,c</sup>	NA	NA	NA	NA	NA	NA	NA

**SUMMARY OF REFERENCE DOSES (RfD), REFERENCE CONCENTRATIONS (RFC), SLOPE FACTORS ( $q_1$ ),  
UNIT RISKS, AND EPA CANCER CLASSIFICATION FROM IRIS AND HEAST IN CHEMICAL ORDER**

Chemical	CAS Number	Oral RfD (mg/kg/day)		Oral Slope Factor (mg/kg/day) <sup>-1</sup>	Oral Unit Risk (µg/L) <sup>-1</sup>	Inhalation RFC (mg/m <sup>3</sup> )		Inhalation Slope Factor (mg/kg/day) <sup>-1</sup>	Inhalation Unit Risk (µg/m <sup>3</sup> ) <sup>-1</sup>	EPA Class
		Chronic	Subchronic			Chronic	Subchronic			
METHYLTRIETHYL LEAD	001782-28-3	NA <sup>d</sup>	NA	NA	NA	NA	NA	NA	NA	NA
METOLACHLOR	051218-45-2	1.50E-01 <sup>a</sup>	1.50E-01 <sup>b</sup>	NA	NA	NA	NA	NA	NA	C <sup>a</sup>
METRIBUZIN	021087-64-9	2.50E-02 <sup>a</sup>	2.50E-02 <sup>b</sup>	NA	NA	NA	NA	NA	NA	D <sup>a</sup>
MIREX	002385-85-5	2.00E-04 <sup>a</sup>	2.00E-04 <sup>b</sup>	NA	NA	NA	NA	NA	NA	B2 <sup>b</sup>
MOLINATE	002212-67-1	2.00E-03 <sup>a</sup>	2.00E-03 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
MOLYBDENUM	007439-98-7	5.00E-03 <sup>a</sup>	5.00E-03 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
MONOCHLORAMINE	010599-90-3	1.00E-01 <sup>a</sup>	1.00E-01 <sup>b</sup>	NA	NA	NA	NA	NA	NA	D <sup>a</sup>
MONOCHLOROBUTANES	025154-42-1	4.00E-01 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA	NA
NALED	000300-76-5	2.00E-03 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
NAPHTHALENE	000091-20-3	NA <sup>c</sup>	NA <sup>c</sup>	NA	NA	NA	NA	NA	NA	D <sup>a</sup>
NAPROPAMIDE	015299-99-7	1.00E-01 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
NIAGARA BLUE 4B	002429-74-5	NA	NA	NA	NA	NA	NA	NA	NA	B2 <sup>b</sup>
NICKEL CARBONYL	013463-39-3	NA	NA	NA	NA	NA	NA	NA	NA	B2 <sup>a</sup>
NICKEL REFINERY DUST		NA	NA	NA	NA	NA	NA	8.40E-01 <sup>b</sup>	2.40E-04 <sup>a</sup>	A
NICKEL SOLUBLE SALTS	007440-02-0	2.00E-02 <sup>a</sup>	2.00E-02 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
NICKEL SUBSULFIDE	012035-72-2	NA	NA	NA	NA	NA	NA	1.70E+00 <sup>b</sup>	4.80E-04 <sup>a</sup>	A
NITRAPYRIN	001929-52-4	NA	NA	NA	NA	NA	NA	NA	NA	NA
NITRATE	014797-55-8	1.50E+00 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
NITRIC OXIDE	010102-43-9	NA	NA	NA	NA	NA	NA	NA	NA	NA
NITRITE	014797-65-0	1.00E-01 <sup>a</sup>	1.00E-01 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
NITROANILINE, 2-	000088-74-4	NA	NA	NA	NA	2.00E-04 <sup>b</sup>	2.00E-03 <sup>b</sup>	NA	NA	NA
NITROBENZENE	000098-95-3	5.00E-04 <sup>a</sup>	5.00E-03 <sup>b</sup>	NA	NA	2.00E-03 <sup>b,c</sup>	2.00E-02 <sup>b,c</sup>	NA	NA	D <sup>a</sup>
NITROFURANTOIN	000067-20-9	7.00E-02 <sup>b</sup>	7.00E-01 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
NITROFURAZONE	000059-87-0	NA	NA	1.50E+00 <sup>b</sup>	4.30E-05 <sup>b</sup>	NA	NA	NA	NA	B2 <sup>b</sup>
NITROGEN DIOXIDE	010102-44-0	NA	1.00E+00 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA

**SUMMARY OF REFERENCE DOSES (RfD), REFERENCE CONCENTRATIONS (RfC), SLOPE FACTORS ( $q_1$ ),  
UNIT RISKS, AND EPA CANCER CLASSIFICATION FROM IRIS AND HEAST IN CHEMICAL ORDER**

Chemical	CAS Number	Oral RfD (mg/kg/day)		Oral Slope Factor (mg/kg/day) <sup>-1</sup>	Oral Unit Risk (µg/L) <sup>-1</sup>	Inhalation RfC (mg/m <sup>3</sup> )		Inhalation Slope Factor (mg/kg/day) <sup>-1</sup>	Inhalation Unit Risk (µg/m <sup>3</sup> ) <sup>-1</sup>	EPA Class
		Chronic	Subchronic			Chronic	Subchronic			
NITROGUANIDINE	000556-88-7	1.00E-01 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	D <sup>b</sup>
NITROPROPANE, 2-	000079-46-9	NA	NA	9.50E+00 <sup>b</sup>	NA	2.00E-02 <sup>a</sup>	2.00E-02 <sup>b</sup>	9.40E+00 <sup>b</sup>	2.70E+03 <sup>b</sup>	B2 <sup>a</sup>
NITROSO-DI-N-BUTYLAMINE, N-	000924-16-3	NA	NA	5.40E+00 <sup>a</sup>	1.80E-04 <sup>a</sup>	NA	NA	5.40E+00 <sup>b</sup>	1.60E-03 <sup>a</sup>	B2 <sup>a</sup>
NITROSO-DI-N-PROPYLAMINE, N-	000621-64-7	NA	NA	7.00E+00 <sup>a</sup>	2.00E-04 <sup>a</sup>	NA	NA	NA	NA	B2 <sup>a</sup>
NITROSO-N-ETHYLUREA, N-	000789-73-9	NA	NA	1.40E+02 <sup>b</sup>	NA	NA	NA	NA	NA	B2 <sup>b</sup>
NITROSO-N-METHYLUREA, N-	000684-93-5	NA	NA	NA	NA	NA	NA	NA	NA	B2 <sup>b</sup>
NITROSODIETHANOLAMINE, N-	001116-54-7	NA	NA	2.80E+00 <sup>a</sup>	8.00E-05 <sup>a</sup>	NA	NA	NA	NA	B2 <sup>a</sup>
NITROSODIETHYLAMINE, N-	000055-18-5	NA	NA	1.50E+02 <sup>a</sup>	4.30E-03 <sup>a</sup>	NA	NA	1.50E+02 <sup>b</sup>	4.30E-02 <sup>a</sup>	B2 <sup>a</sup>
NITROSODIMETHYLAMINE, N-	000062-75-9	NA	NA	5.10E+01 <sup>a</sup>	1.40E-03 <sup>a</sup>	NA	NA	5.10E+01 <sup>b</sup>	1.40E-02 <sup>a</sup>	B2 <sup>a</sup>
NITROSODIPHENYLAMINE, N-	000088-30-6	NA	NA	4.90E-03 <sup>a</sup>	1.40E-07 <sup>a</sup>	NA	NA	NA	NA	B2 <sup>a</sup>
NITROSOMETHYLETHYLAMINE, N-	010595-95-6	NA	NA	2.20E+01 <sup>a</sup>	6.30E-04 <sup>a</sup>	NA	NA	NA	NA	B2 <sup>a</sup>
NITROSOMETHYLVINYLAMINE, N-	004549-40-0	NA	NA	NA	NA	NA	NA	NA	NA	B2 <sup>b</sup>
NITROSPYRROLIDINE, N-	000930-55-2	NA	NA	2.10E+00 <sup>a</sup>	6.10E-05 <sup>a</sup>	NA	NA	2.10E+00 <sup>b</sup>	6.10E-04 <sup>a</sup>	B2 <sup>a</sup>
NITROTOLUENE, m-	000089-08-1	1.00E-02 <sup>b</sup>	1.00E-01 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
NITROTOLUENE, o-	000088-72-2	1.00E-02 <sup>b</sup>	1.00E-01 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
NITROTOLUENE, p-	000099-99-0	1.00E-02 <sup>b</sup>	1.00E-01 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
NORFLURAZON	027314-13-2	4.00E-02 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
NUSTAR	085509-19-9	7.00E-04 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
OCTABROMODIPHENYL ETHER	032536-52-0	3.00E-03 <sup>a</sup>	3.00E-02 <sup>b</sup>	NA	NA	NA	NA	NA	NA	D <sup>b</sup>
OCTAHYDRO-1,3,5,7-TETRANITRO-1,3,5,7-TETRA (HMDS)	002691-41-0	5.00E-02 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	D <sup>a</sup>
OCTAMETHYLPHOSPHORAMIDE	000152-16-9	2.00E-03 <sup>b</sup>	2.00E-03 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
OCTYL PHTHALATE, DI-N-	000117-84-0	2.00E-02 <sup>b</sup>	2.00E-02 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
ORYZALIN	019044-88-3	5.00E-02 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	C <sup>b</sup>
OXADIAZON	019688-30-9	5.00E-03 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
OXAMYL	023135-22-0	2.50E-02 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA

**SUMMARY OF REFERENCE DOSES (RfD), REFERENCE CONCENTRATIONS (RFC), SLOPE FACTORS ( $q^{-1}$ ),  
UNIT RISKS, AND EPA CANCER CLASSIFICATION FROM IRIS AND HEAST IN CHEMICAL ORDER**

Chemical	CAS Number	Oral RfD (mg/kg/day)		Oral Slope Factor (mg/kg/day) $^{-1}$	Oral Unit Risk (µg/L) $^{-1}$	Inhalation RFC (mg/m $^3$ )		Inhalation Slope Factor (mg/kg/day) $^{-1}$	Inhalation Unit Risk (µg/m $^3$ ) $^{-1}$	EPA Class
		Chronic	Subchronic			Chronic	Subchronic			
PACLOBUTRAZOL	078738-62-0	1.30E-02 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
PARAQUAT	001910-42-5	4.50E-03 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	C <sup>a</sup>
PARATHION	000056-38-2	6.00E-03 <sup>b</sup>	6.00E-03 <sup>b</sup>	NA	NA	NA	NA	NA	NA	C <sup>a</sup>
PEBULATE	001114-71-2	5.00E-02 <sup>b</sup>	5.00E-02 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
PENDIMETHALIN	040487-42-1	4.00E-02 <sup>a</sup>	4.00E-02 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
PENTABROMODIPHENYL ETHER	032534-81-9	2.00E-03 <sup>a</sup>	2.00E-02 <sup>b</sup>	NA	NA	NA	NA	NA	NA	D <sup>b</sup>
PENTACHLOROBENZENE	000608-93-5	8.00E-04 <sup>b</sup>	8.00E-03 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
PENTACHLOROCYCLOPENTADIENE	025329-35-5	NA	NA	NA	NA	NA	NA	NA	NA	D <sup>a</sup>
PENTACHLORONITROBENZENE	000082-68-8	3.00E-03 <sup>a</sup>	3.00E-03 <sup>b</sup>	2.80E-01 <sup>b</sup>	7.40E-06 <sup>b</sup>	NA	NA	NA	NA	C <sup>b</sup>
PENTACHLOROPHENOL	000087-86-5	3.00E-02 <sup>a</sup>	3.00E-02 <sup>b</sup>	1.20E-01 <sup>a</sup>	3.00E-06 <sup>a</sup>	NA	NA	NA	NA	B2 <sup>b</sup>
PERMETHRIN	052645-53-1	5.00E-02 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
PHENANTHRENE	000085-01-8	NA	NA	NA	NA	NA	NA	NA	NA	D <sup>a</sup>
PHENMEDIPHAM	013684-63-4	2.50E-01 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
PHENOL	000108-95-2	6.00E-01 <sup>a</sup>	6.00E-01 <sup>b</sup>	NA	NA	NA	NA	NA	NA	D <sup>a</sup>
PHENYLENEDIAMINE, m-	000108-45-2	6.00E-03 <sup>a</sup>	6.00E-02 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
PHENYLENEDIAMINE, o-	000095-54-5	NA	NA	4.70E-02 <sup>b</sup>	1.30E-06 <sup>b</sup>	NA	NA	NA	NA	B2 <sup>b</sup>
PHENYLENEDIAMINE, p-	000106-50-3	1.90E-01 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA	NA
PHENYLMERCURIC ACETATE	000062-38-4	8.00E-05 <sup>a</sup>	8.00E-05 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
PHENYLPHENOL, 2-	000090-43-7	NA	NA	1.94E-03 <sup>b</sup>	5.50E-08 <sup>b</sup>	NA	NA	NA	NA	C <sup>b</sup>
PHORATE	000298-02-2	2.00E-04 <sup>b</sup>	2.00E-04 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
PHOSMET	000732-11-6	2.00E-02 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
PHOSPHINE	007803-51-2	3.00E-04 <sup>a</sup>	3.00E-04 <sup>b</sup>	NA	NA	3.00E-05 <sup>b</sup>	3.00E-04 <sup>b</sup>	NA	NA	D <sup>a</sup>
PHTHALIC ACID, p-	000100-21-0	1.00E+00 <sup>b</sup>	1.00E+00 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
PHTHALIC ANHYDRIDE	000085-44-9	2.00E+00 <sup>a</sup>	2.00E+00 <sup>b</sup>	NA	NA	1.20E-01 <sup>b</sup>	1.20E-01 <sup>b</sup>	NA	NA	NA
PICLORAM	001918-02-1	7.00E-02 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	D <sup>b</sup>

**SUMMARY OF REFERENCE DOSES (RfD), REFERENCE CONCENTRATIONS (RfC), SLOPE FACTORS ( $\text{q}^{-1}$ ),  
UNIT RISKS, AND EPA CANCER CLASSIFICATION FROM IRIS AND HEAST IN CHEMICAL ORDER**

Chemical	CAS Number	Oral RfD (mg/kg/day)		Oral Slope Factor (mg/kg/day) <sup>-1</sup>	Oral Unit Risk ( $\mu\text{g/L}$ ) <sup>-1</sup>	Inhalation RfC (mg/m <sup>3</sup> )		Inhalation Slope Factor (mg/kg/day) <sup>-1</sup>	Inhalation Unit Risk ( $\mu\text{g/m}^3$ ) <sup>-1</sup>	EPA Class
		Chronic	Subchronic			Chronic	Subchronic			
PRIMIPHOS-METHYL	029232-93-7	1.00E-02 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
POLYBROMINATED BIPHENYLS	NA	7.00E-06 <sup>b</sup>	7.00E-05 <sup>b</sup>	8.90E+00 <sup>b</sup>	2.50E-04 <sup>b</sup>	NA	NA	NA	NA	B2 <sup>b</sup>
POLYCHLORINATED BIPHENYLS	001336-36-3	NA	NA	7.70E+00 <sup>a</sup>	2.20E-04 <sup>a</sup>	NA	NA	NA	NA	B2 <sup>a</sup>
POTASSIUM CYANIDE	000151-50-8	5.00E-02 <sup>b</sup>	5.00E-02 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
POTASSIUM SILVER CYANIDE	000508-61-6	2.00E-01 <sup>a</sup>	2.00E-01 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
PROCHLORAZ	087747-09-5	9.00E-03 <sup>b</sup>	NA	1.50E-01 <sup>a</sup>	4.30E-06 <sup>a</sup>	NA	NA	NA	NA	C <sup>a</sup>
PROFLURALIN	026399-36-0	6.00E-03 <sup>b</sup>	6.00E-03 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
PROMETON	001610-18-0	1.50E-02 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	D <sup>a</sup>
PROMETRYN	007287-19-6	4.00E-03 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
PROPACHLOR	001918-16-7	1.30E-02 <sup>a</sup>	1.30E-01 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
PROPANIL	000709-98-8	5.00E-03 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA	NA
PROPARGITE	002312-35-8	2.00E-02 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
PROPARGYL ALCOHOL	000107-19-7	2.00E-03 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
PROPAZINE	000139-40-2	2.00E-02 <sup>a</sup>	2.00E-02 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
PROPHAM	000122-42-0	2.00E-02 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
PROPICONAZOLE	060207-90-1	1.30E-02 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
PROPYLENE GLYCOL	000057-55-6	2.00E+01 <sup>b</sup>	3.00E+01 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
PROPYLENE GLYCOL MONOETHYL ETHER	001569-02-4	7.00E-01 <sup>b</sup>	7.00E+00 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
PROPYLENE GLYCOL MONOMETHYL ETHER	000107-98-2	7.00E-01 <sup>b</sup>	7.00E+00 <sup>b</sup>	NA	NA	2.00E+00 <sup>a</sup>	2.00E+01 <sup>b</sup>	NA	NA	NA
PROPYLENE OXIDE	000075-56-9	NA	NA	2.40E-01 <sup>a</sup>	6.80E-06 <sup>b</sup>	3.00E-02 <sup>a</sup>	3.00E-02 <sup>b</sup>	1.30E-02 <sup>b</sup>	3.70E-06 <sup>a</sup>	B2 <sup>a</sup>
PURSUIT	081335-77-5	2.50E-01 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
PYDRIN	051630-58-1	2.50E-02 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
PYRENE	000129-00-0	3.00E-02 <sup>a</sup>	3.00E-01 <sup>b</sup>	NA	NA	NA	NA	NA	NA	D <sup>a</sup>
PYRIDINE	000110-86-1	1.00E-03 <sup>a</sup>	1.00E-02 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
QUINALPHOS	013593-03-8	5.00E-04 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA	NA

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UNIT RISKS, AND EPA CANCER CLASSIFICATION FROM IRIS AND HEAST IN CHEMICAL ORDER**

Chemical	CAS Number	Oral RfD (mg/kg/day)		Oral Slope Factor (mg/kg/day) <sup>-1</sup>	Oral Unit Risk (µg/L) <sup>-1</sup>	Inhalation RfC (mg/m <sup>3</sup> )		Inhalation Slope Factor (mg/kg/day) <sup>-1</sup>	Inhalation Unit Risk (µg/m <sup>3</sup> ) <sup>-1</sup>	EPA Class
		Chronic	Subchronic			Chronic	Subchronic			
QUINOLINE	000091-22-5	NA	NA	1.20E+01 <sup>b</sup>	3.50E-04 <sup>b</sup>	NA	NA	NA	NA	C <sup>b</sup>
RALLY	088871-89-0	2.50E-02 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
REFRACTORY CERAMIC FIBERS	NA	NA	NA	NA	NA	NA	NA	NA	NA	B2 <sup>a</sup>
RESMETHRIN	010453-86-8	3.00E-02 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
RONNEL	000289-84-3	5.00E-02 <sup>b</sup>	5.00E-02 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
ROTELNONE	000083-79-4	4.00E-03 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
SAVEY	078587-05-0	2.50E-02 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
SELENIOUS ACID	007783-00-8	5.00E-03 <sup>a</sup>	5.00E-03 <sup>b</sup>	NA	NA	NA	NA	NA	NA	D <sup>a</sup>
SELENIUM	007782-49-2	5.00E-03 <sup>a</sup>	5.00E-03 <sup>b</sup>	NA	NA	NA	NA	NA	NA	D <sup>a</sup>
SELENIUM SULFIDE	007446-34-6	NA	NA	NA	NA	NA	NA	NA	NA	B2 <sup>a</sup>
SELENOURA	000630-10-4	5.00E-03 <sup>b</sup>	5.00E-03 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
SETHOXYDIM	074051-80-2	9.00E-02 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
SILVER	007440-22-4	5.00E-03 <sup>a</sup>	5.00E-03 <sup>b</sup>	NA	NA	NA	NA	NA	NA	D <sup>b</sup>
SILVER CYANIDE	000505-64-9	1.00E-01 <sup>a</sup>	1.00E-01 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
SIMAZINE	000122-34-8	5.00E-03 <sup>a</sup>	5.00E-03 <sup>b</sup>	1.20E-01 <sup>b</sup>	3.40E-06 <sup>b</sup>	NA	NA	NA	NA	C <sup>b</sup>
SODIUM ACIFLUORFEN	062476-59-9	1.30E-02 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
SODIUM AZIDE	026628-22-8	4.00E-03 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
SODIUM CYANIDE	000143-33-9	4.00E-02 <sup>a</sup>	4.00E-02 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
SODIUM DIETHYLDITHIOCARBAMATE	000148-18-5	3.00E-02 <sup>a</sup>	3.00E-01 <sup>b</sup>	2.70E-01 <sup>b</sup>	7.70E-06 <sup>b</sup>	NA	NA	NA	NA	C <sup>b</sup>
SODIUM FLUOROACETATE	000082-74-8	2.00E-05 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
SODIUM METAVANADATE	013718-26-8	1.00E-03 <sup>b</sup>	1.00E-02 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
STIROFOS (TETRACHLOROVINPHOS)	000961-11-5	3.00E-02 <sup>a</sup>	3.00E-02 <sup>b</sup>	2.40E-02 <sup>b</sup>	6.90E-07 <sup>b</sup>	NA	NA	NA	NA	C <sup>b</sup>
STRONTIUM, STABLE	007440-24-8	6.00E-01 <sup>a</sup>	6.00E-01 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
STRYCHNINE	000057-24-9	3.00E-04 <sup>a</sup>	3.00E-03 <sup>b</sup>	NA <sup>a</sup>	NA <sup>a</sup>	NA	NA	NA <sup>a</sup>	NA <sup>a</sup>	NA
STYRENE	000100-42-5	2.00E-01 <sup>a</sup>	NA <sup>a</sup>	NA <sup>a</sup>	NA <sup>a</sup>	1.00E+00 <sup>a</sup>	3.00E+00 <sup>b</sup>	NA <sup>a</sup>	NA <sup>a</sup>	NA

**SUMMARY OF REFERENCE DOSES (RfD), REFERENCE CONCENTRATIONS (RfC), SLOPE FACTORS ( $q_1$ ),  
UNIT RISKS, AND EPA CANCER CLASSIFICATION FROM IRIS AND HEAST IN CHEMICAL ORDER**

Chemical	CAS Number	Oral RfD (mg/kg/day)		Oral Slope Factor (mg/kg/day) <sup>-1</sup>	Oral Unit Risk (µg/L) <sup>-1</sup>	Inhalation RfC (mg/m <sup>3</sup> )		Inhalation Slope Factor (mg/kg/day) <sup>-1</sup>	Inhalation Unit Risk (µg/m <sup>3</sup> ) <sup>-1</sup>	EPA Class
		Chronic	Subchronic			Chronic	Subchronic			
TCDD, 2,3,7,8-	001746-01-6	NA	NA	1.50E+05 <sup>b</sup>	4.50E+00 <sup>b</sup>	NA	NA	1.50E+05 <sup>b</sup>	3.30E-05 <sup>b,l</sup>	B2 <sup>b</sup>
TCMTB	021564-17-0	3.00E-02 <sup>b</sup>	3.00E-01 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
TEBUTHIURON	034014-18-1	7.00E-02 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	D <sup>a</sup>
TEMEPHOS	003383-96-8	2.00E-02 <sup>b</sup>	2.00E-01 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
TERBACIL	005902-51-2	1.30E-02 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
TERBUFOS	013071-78-9	2.50E-05 <sup>b</sup>	2.50E-05 <sup>b</sup>	NA	NA	NA	NA	NA	NA	D <sup>a</sup>
TERBUTRYN	000886-50-0	1.00E-03 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
TETRABUTYL LEAD	001920-90-7	NA <sup>d</sup>	NA	NA	NA	NA	NA	NA	NA	NA
TETRACHLOROBENZENE, 1,2,4,5-	000095-94-3	3.00E-04 <sup>a</sup>	3.00E-03 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
TETRACHLOROETHANE, 1,1,1,2-	000630-20-8	3.00E-02 <sup>a</sup>	3.00E-02 <sup>b</sup>	2.60E-02 <sup>a</sup>	7.40E-07 <sup>a</sup>	NA	NA	2.60E-02 <sup>b</sup>	7.40E-06 <sup>a</sup>	C <sup>a</sup>
TETRACHLOROETHANE, 1,1,2,2-	000079-34-5	NA	NA	2.00E-01 <sup>a</sup>	5.80E-06 <sup>a</sup>	NA	NA	2.00E-01 <sup>b</sup>	5.80E-05 <sup>a</sup>	C <sup>a</sup>
TETRACHLOROETHYLENE	000127-18-4	1.00E-02 <sup>a</sup>	1.00E-01 <sup>b</sup>	NA <sup>e</sup>	NA	NA	NA	NA	NA	NA
TETRACHLOROPHENOL, 2,3,4,6-	000058-90-2	3.00E-02 <sup>b</sup>	3.00E-01 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
TETRACHLOROTOLUENE, p-ALPHA, ALPHA, ALPHA-	005216-25-1	NA	NA	2.00E+01 <sup>b</sup>	5.70E-04 <sup>b</sup>	NA	NA	NA	NA	B2 <sup>b</sup>
TETRAETHYL DITHIOPYROPHOSPHATE	003689-24-5	5.00E-04 <sup>a</sup>	5.00E-03 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
TETRAETHYL LEAD	000078-00-2	NA <sup>d</sup>	NA	NA	NA	NA	NA	NA	NA	NA
TETRAMETHYL LEAD	000075-74-1	NA <sup>d</sup>	NA	NA	NA	NA	NA	NA	NA	NA
TETRAPROPYL LEAD	003440-75-3	NA <sup>d</sup>	NA	NA	NA	NA	NA	NA	NA	NA
THALLIC OXIDE	001314-32-5	7.00E-05 <sup>b</sup>	7.00E-04 <sup>b</sup>	NA	NA	NA	NA	NA	NA	D <sup>a</sup>
THALLIUM (I) NITRATE	010102-45-1	9.00E-05 <sup>a</sup>	9.00E-04 <sup>b</sup>	NA	NA	NA	NA	NA	NA	D <sup>a</sup>
THALLIUM (SOLUBLE SALTS)		NA	NA	NA	NA	NA	NA	NA	NA	NA
THALLIUM ACETATE	000563-68-8	9.00E-05 <sup>a</sup>	9.00E-04 <sup>b</sup>	NA	NA	NA	NA	NA	NA	D <sup>a</sup>
THALLIUM CARBONATE	006533-73-9	8.00E-05 <sup>a</sup>	8.00E-04 <sup>b</sup>	NA	NA	NA	NA	NA	NA	D <sup>a</sup>
THALLIUM CHLORIDE	007791-12-0	8.00E-05 <sup>b</sup>	8.00E-04 <sup>b</sup>	NA	NA	NA	NA	NA	NA	D <sup>a</sup>
THALLIUM SELENITE	012039-52-0	NA	NA	NA	NA	NA	NA	NA	NA	D <sup>a</sup>

**SUMMARY OF REFERENCE DOSES (RfD), REFERENCE CONCENTRATIONS (RfC), SLOPE FACTORS ( $q^{-1}$ ),  
UNIT RISKS, AND EPA CANCER CLASSIFICATION FROM IRIS AND HEAST IN CHEMICAL ORDER**

Chemical	CAS Number	Oral RfD (mg/kg/day)		Oral Slope Factor (mg/kg/day) $^{-1}$	Oral Unit Risk (µg/L) $^{-1}$	Inhalation RfC (mg/m $^{3}$ )		Inhalation Slope Factor (mg/kg/day) $^{-1}$	Inhalation Unit Risk (µg/m $^{3}$ ) $^{-1}$	EPA Class
		Chronic	Subchronic			Chronic	Subchronic			
THALLIUM SULFATE	007446-18-6	8.00E-05 <sup>a</sup>	8.00E-04 <sup>b</sup>	NA	NA	NA	NA	NA	NA	D <sup>a</sup>
THIOBENCARB	028249-77-6	1.00E-02 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
THIOFANOX	039196-18-4	3.00E-04 <sup>b</sup>	3.00E-04 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
THIOPHANATE-METHYL	023564-05-8	8.00E-02 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
THIRAM	000137-26-6	6.00E-03 <sup>a</sup>	6.00E-03 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
TIN	007440-31-5	6.00E-01 <sup>b</sup>	6.00E-01 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
TOLUENE	000108-88-3	2.00E-01 <sup>a</sup>	2.00E+00 <sup>b</sup>	NA	NA	4.00E-01 <sup>a</sup>	4.00E-01 <sup>b,e</sup>	NA	NA	D <sup>a</sup>
TOLUENE-2,4-DIAMINE	000095-80-7	NA	NA	3.20E+00 <sup>b</sup>	9.10E-05 <sup>b</sup>	NA	NA	NA	NA	B2 <sup>b</sup>
TOLUENE-2,5-DIAMINE	000095-70-5	6.00E-01 <sup>b</sup>	6.00E-01 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
TOLUENE-2,6-DIAMINE	000823-40-5	2.00E-01 <sup>b</sup>	2.00E-01 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
TOLUIDINE, o-(METHYLANILINE, 2-)	000095-53-4	NA	NA	2.40E-01 <sup>b</sup>	6.90E-06 <sup>b</sup>	NA	NA	NA	NA	B2 <sup>b</sup>
TOLUIDINE, p-	000106-49-0	NA	NA	1.80E-01 <sup>b</sup>	5.40E-06 <sup>b</sup>	NA	NA	NA	NA	C
TOXAPHENE	008001-35-2	NA	NA	1.10E+00 <sup>a</sup>	3.20E-05 <sup>a</sup>	NA	NA	1.10E+00 <sup>b</sup>	3.20E-04 <sup>a</sup>	B2 <sup>a</sup>
TRALOMETHRIN	066841-25-8	7.50E-03 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
TRIALLATE	002303-17-6	1.30E-02 <sup>a</sup>	1.30E-02 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
TRIASULFURON	082097-50-5	1.00E-02 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
TRIBROMOBENZENE, 1,2,4-	000815-54-3	5.00E-03 <sup>a</sup>	5.00E-02 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
TRIBROMOCHLOROMETHANE	000594-15-0	NA	NA	NA	NA	NA	NA	NA	NA	D <sup>a</sup>
TRIBROMODIPHENYL ETHER	049890-84-0	NA	NA	NA	NA	NA	NA	NA	NA	D <sup>a</sup>
TRIBUTYLTIN OXIDE	000058-35-9	3.00E-05 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
TRICHLORO-1,2,2-TRIFLUOROETHANE, 1,1,2-	000078-13-1	3.00E+01 <sup>a</sup>	3.00E+00 <sup>b</sup>	NA	NA	3.00E+01 <sup>b</sup>	3.00E+01 <sup>b</sup>	NA	NA	NA
TRICHLORO-2-HYDROXYDIPHENYLETHER	003380-34-5	NA	4.00E+00 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
TRICHLOROANILINE HCL, 2,4,6-	033663-50-2	NA	NA	2.90E-02 <sup>b</sup>	8.20E-07 <sup>b</sup>	NA	NA	NA	NA	C <sup>b</sup>
TRICHLOROANILINE, 2,4,6-	000634-93-5	NA	NA	3.40E-02 <sup>b</sup>	1.00E-06 <sup>b</sup>	NA	NA	NA	NA	C <sup>b</sup>
TRICHLOROBENZENE, 1,2,4-	000120-82-1	1.00E-02 <sup>a</sup>	1.00E-02 <sup>b</sup>	NA	NA	2.00E-01 <sup>b</sup>	2.00E+00 <sup>b</sup>	NA	NA	D <sup>a</sup>

**SUMMARY OF REFERENCE DOSES (RfD), REFERENCE CONCENTRATIONS (RfC), SLOPE FACTORS ( $q_1$ ),  
UNIT RISKS, AND EPA CANCER CLASSIFICATION FROM IRIS AND HEAST IN CHEMICAL ORDER**

Chemical	CAS Number	Oral RfD (mg/kg/day)		Oral Slope Factor (mg/kg/day) <sup>-1</sup>	Oral Unit Risk (µg/L) <sup>-1</sup>	Inhalation RfC (mg/m <sup>3</sup> )		Inhalation Slope Factor (mg/kg/day) <sup>-1</sup>	Inhalation Unit Risk (µg/m <sup>3</sup> ) <sup>-1</sup>	EPA Class
		Chronic	Subchronic			Chronic	Subchronic			
TRICHLOROETHANE, 1,1,1-	000071-55-6	NA <sup>e</sup>	NA <sup>e</sup>	NA	NA	NA <sup>e</sup>	NA <sup>e</sup>	NA	NA	D <sup>a</sup>
TRICHLOROETHANE, 1,1,2-	000079-00-5	4.00E-03 <sup>a</sup>	4.00E-02 <sup>b</sup>	5.70E-02 <sup>a</sup>	1.60E-06 <sup>a</sup>	NA	NA	5.70E-02 <sup>b</sup>	1.80E-05 <sup>a</sup>	C <sup>b</sup>
TRICHLOROETHYLENE	000079-01-6	NA	NA	NA <sup>e</sup>	NA	NA	NA	NA <sup>e</sup>	NA	NA
TRICHLOROFLUOROMETHANE	000075-69-4	3.00E-01 <sup>a</sup>	7.00E-01 <sup>b</sup>	NA	NA	7.00E-01 <sup>b,c</sup>	7.00E+00 <sup>b,c</sup>	NA	NA	NA
TRICHLOROPHENOL, 2,4,5-	000095-95-4	1.00E-01 <sup>a</sup>	1.00E+00 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
TRICHLOROPHENOL, 2,4,6-	000088-06-2	NA	NA	1.10E-02 <sup>a</sup>	3.10E-07 <sup>a</sup>	NA	NA	1.00E-02 <sup>b</sup>	3.10E-06 <sup>a</sup>	B2 <sup>a</sup>
TRICHLOROPHOXY) PROPIONIC ACID, 2(2,4,5-	000093-72-1	8.00E-03 <sup>a</sup>	8.00E-03 <sup>b</sup>	NA	NA	NA	NA	NA	NA	D <sup>a</sup>
TRICHLOROPHOXYACETIC ACID, 2,4,5-	000093-76-5	1.00E-02 <sup>a</sup>	1.00E-01 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
TRICHLOROPROPANE, 1,1,2-	000598-77-6	5.00E-03 <sup>a</sup>	5.00E-02 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
TRICHLOROPROPANE, 1,2,3-	000096-18-4	6.00E-03 <sup>a</sup>	6.00E-02 <sup>b</sup>	7.00E+00 <sup>b</sup>	2.00E-04 <sup>b</sup>	NA	NA	NA	NA	B2 <sup>a</sup>
TRICHLOROPROPENE, 1,2,3-	000096-19-5	5.00E-03 <sup>b</sup>	5.00E-03 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
TRICHLOROTOLUENE, 2,3,6-	002077-46-5	NA	5.00E-05 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
TRICHLOROTOLUENE, ALPHA 2,6-	002014-83-7	NA	5.00E-05 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
TRIDIPHANE	058138-08-2	3.00E-03 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
TRIETHYL LEAD	005224-23-7	NA <sup>d</sup>	NA	NA	NA	NA	NA	NA	NA	NA
TRIETHYLAMINE	000121-44-8	NA	NA	NA	NA	7.00E-03 <sup>a</sup>	NA	NA	NA	NA
TRIFLURALIN	001582-09-8	7.50E-03 <sup>b</sup>	7.50E-03 <sup>b</sup>	7.70E-03 <sup>a</sup>	2.20E-07 <sup>a</sup>	NA	NA	NA	NA	C <sup>a</sup>
TRIMETHYL LEAD	007442-13-9	NA <sup>d</sup>	NA	NA	NA	NA	NA	NA	NA	NA
TRIMETHYL PHOSPHATE	000512-56-1	NA	NA	3.70E-02 <sup>b</sup>	1.10E-06 <sup>b</sup>	NA	NA	NA	NA	B2 <sup>a</sup>
TRIMETHYLETHYL LEAD	001762-26-1	NA <sup>d</sup>	NA	NA	NA	NA	NA	NA	NA	NA
TRINITROBENZENE, 1,3,5-	000099-35-4	5.00E-05 <sup>a</sup>	5.00E-04 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
TRINITROPHENYLMETHYLNITRAMINE	000479-45-8	1.00E-02 <sup>b</sup>	1.00E-01 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
TRINITROTOLUENE, 2,4,6-	000118-96-7	5.00E-04 <sup>a</sup>	5.00E-04 <sup>b</sup>	3.00E-02 <sup>a</sup>	9.00E-07 <sup>a</sup>	NA	NA	NA	NA	C <sup>a</sup>
TRIPROPYL LEAD	006818-03-7	NA <sup>d</sup>	NA	NA	NA	NA	NA	NA	NA	NA
URANIUM (SOLUBLE SALTS)	NA	3.00E-03 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA

**SUMMARY OF REFERENCE DOSES (RfD), REFERENCE CONCENTRATIONS (RFC), SLOPE FACTORS ( $q_1$ ),  
UNIT RISKS, AND EPA CANCER CLASSIFICATION FROM IRIS AND HEAST IN CHEMICAL ORDER**

Chemical	CAS Number	Oral RfD (mg/kg/day)		Oral Slope Factor (mg/kg/day) <sup>-1</sup>	Oral Unit Risk (µg/L) <sup>-1</sup>	Inhalation RFC (mg/m <sup>3</sup> )		Inhalation Slope Factor (mg/kg/day) <sup>-1</sup>	Inhalation Unit Risk (µg/m <sup>3</sup> ) <sup>-1</sup>	EPA Class
		Chronic	Subchronic			Chronic	Subchronic			
VANADIUM PENTOXIDE	001314-62-1	9.00E-03 <sup>a</sup>	9.00E-03 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
VANADIUM SULFATE	036907-42-3	2.00E-02 <sup>b</sup>	2.00E-02 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
VANADIUM, METALLIC	007440-62-2	7.00E-03 <sup>b</sup>	7.00E-03 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
VANADYL SULFATE	027774-13-6	2.00E-02 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA	NA
VERNOLATE	001929-77-7	1.00E-03 <sup>a</sup>	1.00E-02 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
VINCLOZOLIN	050471-44-8	2.50E-02 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
VINYL ACETATE	000108-05-4	1.00E+00 <sup>b</sup>	1.00E+00 <sup>b</sup>	NA	NA	2.00E-01 <sup>a</sup>	2.00E-01 <sup>b</sup>	NA	NA	NA
VINYL BROMIDE	000593-60-2	NA	NA	NA	NA	3.00E-03 <sup>a</sup>	3.00E-03 <sup>b</sup>	1.10E-01 <sup>b</sup>	3.20E-05 <sup>b</sup>	B2
VINYL CHLORIDE	000075-01-4	NA	NA <sup>a</sup>	1.90E+00 <sup>b</sup>	5.40E-05 <sup>b</sup>	NA	NA	3.00E-01 <sup>b</sup>	8.40E-05 <sup>b</sup>	A
WARFARIN	000081-81-2	3.00E-04 <sup>a</sup>	3.00E-04 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
WHITE PHOSPHORUS	007723-14-0	2.00E-05 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	D <sup>a</sup>
XYLENE, MIXTURE	001330-20-7	2.00E+00 <sup>a</sup>	NA <sup>a</sup>	NA	NA	NA	NA	NA	NA	D <sup>a</sup>
XYLENE, m-	000108-38-3	2.00E+00 <sup>b</sup>	NA <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA
XYLENE, o-	000085-47-6	2.00E+00 <sup>b</sup>	NA <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA
XYLENE, p-	000108-42-3	NA	NA <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA
ZINC (METALLIC)	007440-66-6	3.00E-01 <sup>a</sup>	3.00E-01 <sup>b</sup>	NA	NA	NA	NA	NA	NA	D <sup>a</sup>
ZINC CYANIDE	000557-21-1	5.00E-02 <sup>a</sup>	5.00E-02 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
ZINC PHOSPHIDE	001314-84-7	3.00E-04 <sup>a</sup>	3.00E-03 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
ZINEB	012122-87-7	5.00E-02 <sup>a</sup>	5.00E-02 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA

<sup>a</sup> Source: Integrated Risk Information System (IRIS)

<sup>b</sup> Source: Health Effects Assessment Summary Table (HEAST) FY1994 and July Supplement

<sup>c</sup> This value was derived from methodology that is not current with the interim inhalation methodology used by the RfD/RFC Work Group (see HEAST Table 2 for details).

<sup>d</sup> Lead Alkyls - See IRIS cover sheet for further explanation

<sup>e</sup> Contact the Superfund Health Risk Technical Support Center: (513) 569-7300

<sup>f</sup> HEAST concluded that toxicity data were inadequate for calculation of a subchronic RfD for copper and substituted the current drinking water standard (MCLG) of 1.3 mg/L.

<sup>g</sup> Listed as "Dinitrotoluene mixture, 2,4-/2,6-" in IRIS. The value is based on a study using technical grade DNT.

<sup>h</sup> Value expressed as fibers/mL.

<sup>i</sup> (pg/m<sup>3</sup>)<sup>-1</sup>

**SUMMARY OF REFERENCE DOSES (RFD), REFERENCE CONCENTRATIONS (RFC),  
SLOPE FACTORS ( $Q_1^*$ ), UNIT RISKS, AND EPA CANCER CLASSIFICATION  
FROM IRIS AND HEAST**

**IN CAS NUMBER ORDER**

**OCTOBER 1994**

**SUMMARY OF REFERENCE DOSES (RfD), REFERENCE CONCENTRATIONS (RfC), SLOPE FACTORS ( $q_1^*$ ),  
UNIT RISKS, AND EPA CANCER CLASSIFICATION FROM IRIS AND HEAST IN CAS NUMBER ORDER**

CAS Number	Chemical	Oral RfD (mg/kg/day)		Oral Slope Factor (mg/kg/day) <sup>-1</sup>	Oral Unit Risk (µg/L) <sup>-1</sup>	Inhalation RfC (mg/m <sup>3</sup> )		Inhalation Slope Factor (mg/kg/day) <sup>-1</sup>	Inhalation Unit Risk (µg/m <sup>3</sup> ) <sup>-1</sup>	EPA Class
		Chronic	Subchronic			Chronic	Subchronic			
000050-00-0	FORMALDEHYDE	2.00E-01 <sup>a</sup>	2.00E-01 <sup>b</sup>	NA	NA	NA	NA	4.50E-02 <sup>b</sup>	1.30E-05 <sup>a</sup>	B1 <sup>a</sup>
000050-29-3	DDT	5.00E-04 <sup>a</sup>	5.00E-04 <sup>b</sup>	3.40E-01 <sup>a</sup>	8.70E-06 <sup>a</sup>	NA	NA	3.40E-01 <sup>b</sup>	9.70E-05 <sup>a</sup>	B2 <sup>a</sup>
000050-32-8	BENZO[A]PYRENE	NA	NA	7.30E+00 <sup>b</sup>	2.10E-04 <sup>a</sup>	NA	NA	NA	NA	B2 <sup>a</sup>
000051-28-5	DINITROPHENOL, 2,4-	2.00E-03 <sup>a</sup>	2.00E-03 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
000053-70-3	DIBENZ[A,H]ANTHRACENE	NA	NA	NA	NA	NA	NA	NA	NA	B2 <sup>a</sup>
000055-18-5	NITROSODIETHYLAMINE, N-	NA	NA	1.50E+02 <sup>a</sup>	4.30E-03 <sup>a</sup>	NA	NA	1.50E+02 <sup>b</sup>	4.30E-02 <sup>a</sup>	B2 <sup>a</sup>
000056-23-6	CARBON TETRACHLORIDE	7.00E-04 <sup>a</sup>	7.00E-03 <sup>b,e</sup>	1.30E-01 <sup>a</sup>	3.70E-06 <sup>a</sup>	NA	NA	5.30E-02 <sup>b</sup>	1.50E-05 <sup>a</sup>	B2 <sup>a</sup>
000056-35-9	TRIBUTYLTIN OXIDE	3.00E-06 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
000056-38-2	PARATHION	6.00E-03 <sup>b</sup>	6.00E-03 <sup>b</sup>	NA	NA	NA	NA	NA	NA	C <sup>a</sup>
000056-53-1	DIETHYLSТИLBESTEROL	NA	NA	4.70E+03 <sup>b</sup>	1.30E-01 <sup>b</sup>	NA	NA	4.80E+02 <sup>b</sup>	NA	A <sup>b</sup>
000056-55-3	BENZA[J]ANTHRACENE	NA	NA	NA	NA	NA	NA	NA	NA	B2 <sup>a</sup>
000057-12-5	CYANIDE (CN-)	2.00E-02 <sup>a</sup>	2.00E-02 <sup>b</sup>	NA	NA	NA	NA	NA	NA	D <sup>b</sup>
000057-24-9	STRYCHNINE	3.00E-04 <sup>a</sup>	3.00E-03 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
000057-55-8	PROPYLENE GLYCOL	2.00E+01 <sup>b</sup>	3.00E+01 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
000057-74-9	CHLORDANE	8.00E-05 <sup>a</sup>	8.00E-05 <sup>b,e</sup>	1.30E+00 <sup>a</sup>	3.70E-05 <sup>a</sup>	NA	NA	1.30E+00 <sup>b</sup>	3.70E-04 <sup>a</sup>	B2 <sup>a</sup>
000058-89-9	HEXACHLOROCYCLOHEXANE, GAMMA-	3.00E-04 <sup>a</sup>	3.00E-03 <sup>b</sup>	1.30E+00 <sup>b</sup>	3.70E-05 <sup>b</sup>	NA	NA	NA	NA	B2 <sup>b</sup>
000058-90-2	TETRACHLOROPHENOL, 2,3,4,6-	3.00E-02 <sup>a</sup>	3.00E-01 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA <sup>b</sup>
000059-87-0	NITROFURAZONE	NA	NA	1.50E+00 <sup>b</sup>	4.30E-05 <sup>b</sup>	NA	NA	NA	NA	B2 <sup>a</sup>
000060-29-7	ETHYL ETHER	2.00E-01 <sup>a</sup>	2.00E+00 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
000060-51-5	DIMETHOATE	2.00E-04 <sup>a</sup>	2.00E-04 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
000060-57-1	DIELDRIN	5.00E-05 <sup>a</sup>	5.00E-05 <sup>b</sup>	1.60E+01 <sup>a</sup>	4.60E-04 <sup>a</sup>	NA	NA	1.60E+01 <sup>b</sup>	4.60E-03 <sup>a</sup>	B2 <sup>a</sup>
000062-38-4	PHENYLMERCURIC ACETATE	8.00E-05 <sup>a</sup>	8.00E-05 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
000062-53-3	ANILINE	NA	NA	5.70E-03 <sup>a</sup>	1.60E-07 <sup>a</sup>	1.00E-03 <sup>a</sup>	1.00E-02 <sup>b</sup>	NA	NA	B2 <sup>a</sup>
000062-73-7	DICHLORVOS	5.00E-04 <sup>a</sup>	NA	2.90E-01 <sup>a</sup>	8.30E-06 <sup>a</sup>	5.00E-04 <sup>a</sup>	NA	NA	NA	B2 <sup>a</sup>
000062-74-8	SODIUM FLUOROACETATE	2.00E-05 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA

**SUMMARY OF REFERENCE DOSES (RfD), REFERENCE CONCENTRATIONS (RfC), SLOPE FACTORS ( $q_1^+$ ),  
UNIT RISKS, AND EPA CANCER CLASSIFICATION FROM IRIS AND HEAST IN CAS NUMBER ORDER**

CAS Number	Chemical	Oral RfD (mg/kg/day)		Oral Slope Factor (mg/kg/day) <sup>-1</sup>	Oral Unit Risk (µg/L) <sup>-1</sup>	Inhalation RfC (mg/m <sup>3</sup> )		Inhalation Slope Factor (mg/kg/day) <sup>-1</sup>	Inhalation Unit Risk (µg/m <sup>3</sup> ) <sup>-1</sup>	EPA Class
		Chronic	Subchronic			Chronic	Subchronic			
000062-75-9	NITROSODIMETHYLAMINE, N-	NA	NA	5.10E+01 <sup>a</sup>	1.40E-03 <sup>a</sup>	NA	NA	5.10E+01 <sup>b</sup>	1.40E-02 <sup>a</sup>	B2 <sup>a</sup>
000063-25-2	CARBARYL	1.00E-01 <sup>a</sup>	1.00E-01 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
000064-18-6	FORMIC ACID	2.00E+00	2.00E+00 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
000065-85-0	BENZOIC ACID	4.00E+00 <sup>a</sup>	4.00E+00 <sup>b</sup>	NA	NA	NA	NA	NA	NA	D <sup>a</sup>
000067-20-9	NITROFURANTOIN	7.00E-02	7.00E-01 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
000067-45-8	FURAZOLIDONE	NA	NA	3.80E+00 <sup>b</sup>	1.00E-04 <sup>b</sup>	NA	NA	NA	NA	B2 <sup>b</sup>
000067-56-1	METHANOL	5.00E-01 <sup>a</sup>	5.00E+00 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
000067-64-1	ACETONE	1.00E-01 <sup>a</sup>	1.00E+00 <sup>b</sup>	NA	NA	NA	NA	NA	NA	D <sup>a</sup>
000067-66-3	CHLOROFORM	1.00E-02 <sup>a</sup>	1.00E-02 <sup>b,a</sup>	6.10E-03 <sup>a</sup>	1.70E-07 <sup>a</sup>	NA	NA	8.10E-02 <sup>b</sup>	2.30E-05 <sup>a</sup>	B2 <sup>a</sup>
000067-72-1	HEXACHLOROETHANE	1.00E-03 <sup>a</sup>	1.00E-02 <sup>b</sup>	1.40E-02 <sup>a</sup>	4.00E-07 <sup>a</sup>	NA	NA	1.40E-02 <sup>b</sup>	4.00E-06 <sup>a</sup>	C <sup>a</sup>
000068-12-2	DIMETHYLFORMAMIDE	1.00E-01 <sup>b</sup>	1.00E+00 <sup>b</sup>	NA	NA	3.00E-02 <sup>a</sup>	3.00E-02 <sup>b</sup>	NA	NA	NA
000070-30-4	HEXACHLOROPHENE	3.00E-04 <sup>a</sup>	3.00E-03 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
000071-36-3	BUTANOL, N-	1.00E-01 <sup>a</sup>	1.00E+00 <sup>b</sup>	NA	NA	NA	NA	NA	NA	D <sup>a</sup>
000071-43-2	BENZENE	NA	NA	2.90E-02 <sup>a</sup>	8.30E-07 <sup>a</sup>	NA	NA	2.80E-02 <sup>b</sup>	8.30E-06 <sup>a</sup>	A <sup>a</sup>
000071-55-6	TRICHLOROETHANE, 1,1,1-	NA	NA	NA	NA	NA	NA	NA	NA	D
000072-20-8	ENDRIN	3.00E-04 <sup>a</sup>	3.00E-04 <sup>b</sup>	NA	NA	NA	NA	NA	NA	D <sup>a</sup>
000072-43-5	METHOXYCHLOR	5.00E-03 <sup>a</sup>	5.00E-03 <sup>b</sup>	NA	NA	NA	NA	NA	NA	D <sup>a</sup>
000072-54-8	DDD	NA	NA	2.40E-01 <sup>a</sup>	6.80E-06 <sup>a</sup>	NA	NA	NA	NA	B2 <sup>a</sup>
000072-55-9	DDE	NA	NA	3.40E-01 <sup>a</sup>	9.70E-06 <sup>a</sup>	NA	NA	NA	NA	B2 <sup>a</sup>
000074-11-3	CHLOROBENZOIC ACID, p-	2.00E-01 <sup>b</sup>	2.00E+00 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
000074-83-9	BROMOMETHANE	1.40E-03 <sup>a</sup>	1.40E-02 <sup>b,e</sup>	NA	NA	5.00E-03 <sup>a</sup>	5.00E-03 <sup>b,e</sup>	NA	NA	D <sup>a</sup>
000074-87-3	CHLOROMETHANE	NA	NA <sup>e</sup>	1.30E-02 <sup>b</sup>	3.70E-07 <sup>b</sup>	NA	NA <sup>e</sup>	6.30E-03 <sup>b</sup>	1.80E-06 <sup>b</sup>	C <sup>b</sup>
000074-90-6	HYDROGEN CYANIDE	2.00E-02 <sup>a</sup>	NA	NA	NA	3.00E-03 <sup>a</sup>	NA	NA	NA	NA
000074-95-3	DIBROMOMETHANE (METHYLENE BROMIDE)	1.00E-02 <sup>b,c</sup>	1.00E-01 <sup>b,c</sup>	NA	NA	NA	NA	NA	NA	NA
000074-97-5	BROMOCHLOROMETHANE	NA	NA	NA	NA	NA	NA	NA	NA	D <sup>a</sup>

**SUMMARY OF REFERENCE DOSES (RfD), REFERENCE CONCENTRATIONS (RFC), SLOPE FACTORS ( $q_1^*$ ),  
UNIT RISKS, AND EPA CANCER CLASSIFICATION FROM IRIS AND HEAST IN CAS NUMBER ORDER**

CAS Number	Chemical	Oral RfD (mg/kg/day)		Oral Slope Factor (mg/kg/day) <sup>-1</sup>	Oral Unit Risk (µg/L) <sup>-1</sup>	Inhalation RFC (mg/m <sup>3</sup> )		Inhalation Slope Factor (mg/kg/day) <sup>-1</sup>	Inhalation Unit Risk (µg/m <sup>3</sup> ) <sup>-1</sup>	EPA Class
		Chronic	Subchronic			Chronic	Subchronic			
000075-00-3	ETHYL CHLORIDE	NA	NA	NA	NA	1.00E+01 <sup>a</sup>	1.00E+01 <sup>b</sup>	NA	NA	NA <sup>b</sup>
000075-01-4	VINYL CHLORIDE	NA	NA <sup>e</sup>	1.90E+00 <sup>b</sup>	5.40E-05 <sup>b</sup>	NA	NA	3.00E-01	8.40E-05	A
000075-05-8	ACETONITRILE	6.00E-03 <sup>a</sup>	6.00E-02 <sup>b</sup>	NA	NA	5.00E-02 <sup>b,c</sup>	5.00E-01 <sup>b,c</sup>	NA	NA	NA
000075-07-0	ACETALDEHYDE	NA	NA	NA	NA	8.00E-03 <sup>a</sup>	NA	NA	2.20E-06 <sup>a</sup>	B2
000075-09-2	METHYLENE CHLORIDE	8.00E-02 <sup>a</sup>	6.00E-02 <sup>b</sup>	7.50E-03 <sup>a</sup>	2.10E-07 <sup>a</sup>	3.00E+00 <sup>b</sup>	3.00E+00 <sup>b</sup>	NA	4.70E-07 <sup>a</sup>	B2
000075-15-0	CARBON DISULFIDE	1.00E-01 <sup>a</sup>	1.00E-01 <sup>b</sup>	NA	NA	1.00E-02 <sup>b</sup>	1.00E-02 <sup>b</sup>	NA	NA	NA
000075-21-8	ETHYLENE OXIDE	NA	NA	1.02E+00 <sup>b</sup>	2.90E-05 <sup>b</sup>	NA	NA	3.50E-01 <sup>b</sup>	1.00E-04	B1
000075-25-2	BROMOFORM	2.00E-02 <sup>a</sup>	2.00E-01 <sup>b</sup>	7.90E-03 <sup>a</sup>	2.30E-07 <sup>a</sup>	NA	NA	3.90E-03 <sup>b</sup>	1.10E-06 <sup>a</sup>	B2
000075-27-4	BROMODICHLOROMETHANE	2.00E-02 <sup>a</sup>	2.00E-02 <sup>b</sup>	6.20E-02 <sup>a</sup>	1.80E-06 <sup>a</sup>	NA	NA	NA	NA	B2
000075-29-6	CHLOROPROPANE, 2-	NA	NA	NA	NA	1.00E-01 <sup>b</sup>	1.00E+00 <sup>b</sup>	NA	NA	NA
000075-34-3	DICHLOROETHANE, 1,1-	1.00E-01 <sup>b</sup>	1.00E+00 <sup>b</sup>	NA	NA	5.00E-01 <sup>b,c</sup>	5.00E+00 <sup>b,c</sup>	NA	NA	C <sup>a</sup>
000075-35-4	DICHLOROETHYLENE, 1,1-	9.00E-03 <sup>a</sup>	9.00E-03 <sup>b</sup>	6.00E-01 <sup>a</sup>	1.70E-05 <sup>a</sup>	NA	NA	1.20E+00 <sup>b</sup>	5.00E-05 <sup>a</sup>	C <sup>a</sup>
000075-37-8	DIFLUOROETHANE, 1,1-	NA	NA	NA	NA	4.00E+01 <sup>2</sup>	NA	NA	NA	NA
000075-45-8	CHLORODIFLUOROMETHANE	NA	NA	NA	NA	5.00E+01 <sup>2</sup>	NA	NA	NA	NA
000075-86-9	PROPYLENE OXIDE	NA	NA	2.40E-01 <sup>a</sup>	6.80E-06 <sup>a</sup>	3.00E-02 <sup>a</sup>	3.00E-02 <sup>b</sup>	1.30E-02 <sup>b</sup>	3.70E-06 <sup>a</sup>	B2
000075-80-5	CACODYLIC ACID	3.00E-03 <sup>b</sup>	3.00E-02 <sup>b</sup>	NA	NA	NA	NA	NA	NA	D <sup>a</sup>
000075-62-7	BROMOTRICHLOROMETHANE	NA	NA	NA	NA	NA	NA	NA	NA	D <sup>a</sup>
000075-89-4	TRICHLOROFLUOROMETHANE	3.00E-01 <sup>a</sup>	7.00E-01 <sup>b</sup>	NA	NA	7.00E-01 <sup>b,c</sup>	7.00E+00 <sup>b,c</sup>	NA	NA	NA
000075-71-8	DICHLORODIFLUOROMETHANE	2.00E-01 <sup>b</sup>	9.00E-01 <sup>b</sup>	NA	NA	2.00E-01 <sup>b,c</sup>	2.00E+00 <sup>b,c</sup>	NA	NA	D <sup>a</sup>
000075-74-1	TETRAMETHYL LEAD	NA <sup>d</sup>	NA	NA	NA	NA	NA	NA	NA	NA
000075-86-5	ACETONE CYANOHYDRIN	7.00E-02 <sup>b</sup>	7.00E-02 <sup>b</sup>	NA	NA	1.00E-02 <sup>b,c</sup>	1.00E-01 <sup>b,c</sup>	NA	NA	NA
000075-87-6	CHLORAL	2.00E-03 <sup>a</sup>	2.00E-02 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
000075-99-0	DALAPON	3.00E-02 <sup>a</sup>	3.00E-02 <sup>b</sup>	NA	NA	NA	NA	NA	NA	D <sup>a</sup>
000076-13-1	TRICHLORO-1,2,2-TRIFLUOROETHANE, 1,1,2-	3.00E+01 <sup>a</sup>	3.00E+00 <sup>b</sup>	NA	NA	3.00E+01 <sup>b</sup>	3.00E+01 <sup>b</sup>	NA	NA	NA
000076-44-8	HEPTACHLOR	5.00E-04 <sup>a</sup>	5.00E-04 <sup>b</sup>	4.50E+00 <sup>b</sup>	1.30E-04 <sup>a</sup>	NA	NA	4.50E+00 <sup>b</sup>	1.30E-03 <sup>a</sup>	B2

**SUMMARY OF REFERENCE DOSES (RfD), REFERENCE CONCENTRATIONS (RfC), SLOPE FACTORS ( $a_1^*$ ),  
UNIT RISKS, AND EPA CANCER CLASSIFICATION FROM IRIS AND HEAST IN CAS NUMBER ORDER**

CAS Number	Chemical	Oral RfD (mg/kg/day)		Oral Slope Factor (mg/kg/day) <sup>-1</sup>	Oral Unit Risk (µg/L) <sup>-1</sup>	Inhalation RfC (mg/m <sup>3</sup> )		Inhalation Slope Factor (mg/kg/day) <sup>-1</sup>	Inhalation Unit Risk (µg/m <sup>3</sup> ) <sup>-1</sup>	EPA Class
		Chronic	Subchronic			Chronic	Subchronic			
000077-47-4	HEXACHLOROCYCLOPENTADIENE	7.00E-03 <sup>a</sup>	7.00E-02 <sup>b</sup>	NA	NA	7.00E-05 <sup>b</sup>	7.00E-04 <sup>b</sup>	NA	NA	D <sup>a</sup>
000077-73-6	DICYCLOPENTADIENE	3.00E-02 <sup>b</sup>	3.00E-01 <sup>b</sup>	NA	NA	2.00E-04 <sup>b,c</sup>	2.00E-03 <sup>b,c</sup>	NA	NA	NA
000077-78-1	DIMETHYL SULFATE	NA	NA	NA	NA	NA	NA	NA	NA	B2 <sup>a</sup>
000078-00-2	TETRAETHYL LEAD	NA <sup>d</sup>	NA	NA	NA	NA	NA	NA	NA	NA
000078-48-8	MERPHOS OXIDE	3.00E-05 <sup>a</sup>	3.00E-04 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
000078-59-1	ISOPHORONE	2.00E-01 <sup>a</sup>	2.00E+00 <sup>b</sup>	9.50E-04 <sup>a</sup>	2.70E-08 <sup>a</sup>	NA	NA	NA	NA	C <sup>a</sup>
000078-83-1	ISOBUTYL ALCOHOL	3.00E-01 <sup>a</sup>	3.00E+00 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
000078-88-4	CHLOROBUTANE, 2-	NA	NA	NA	NA	NA	NA	NA	NA	D <sup>a</sup>
000078-87-5	DICHLOROPROPANE, 1,2-	NA	NA	6.80E-02 <sup>b</sup>	1.90E-06 <sup>b</sup>	4.00E-03 <sup>a</sup>	1.30E-02 <sup>b</sup>	NA	NA	B2 <sup>b</sup>
000078-93-3	METHYL ETHYL KETONE	6.00E-01 <sup>a</sup>	2.00E+00 <sup>b</sup>	NA	NA	1.00E+00 <sup>a</sup>	1.00E+00 <sup>b</sup>	NA	NA	D <sup>a</sup>
000079-00-5	TRICHLOROETHANE, 1,1,2-	4.00E-03 <sup>a</sup>	4.00E-02 <sup>b</sup>	5.70E-02 <sup>a</sup>	1.80E-06 <sup>a</sup>	NA	NA	5.70E-02 <sup>b</sup>	1.80E-05 <sup>a</sup>	C <sup>a</sup>
000079-01-6	TRICHLOROETHYLENE	NA	NA	NA <sup>e</sup>	NA	NA	NA	NA <sup>e</sup>	NA	NA
000079-06-1	ACRYLAMIDE	2.00E-04 <sup>a</sup>	2.00E-03 <sup>b</sup>	4.50E+00 <sup>a</sup>	1.30E-04 <sup>a</sup>	NA	NA	4.50E+00 <sup>b</sup>	1.30E-03 <sup>a</sup>	B2 <sup>a</sup>
000079-10-7	ACRYLIC ACID	5.00E-01 <sup>a</sup>	5.00E-01 <sup>b</sup>	NA	NA	1.00E-03 <sup>a</sup>	3.00E-03 <sup>b</sup>	NA	NA	NA
000079-11-8	CHLOROACETIC ACID	2.00E-03 <sup>b</sup>	2.00E-02 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
000079-20-9	METHYL ACETATE	1.00E+00 <sup>b</sup>	1.00E+01 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
000079-34-8	TETRACHLOROETHANE, 1,1,2,2-	NA	NA	2.00E-01 <sup>a</sup>	5.80E-06 <sup>a</sup>	NA	NA	2.00E-01 <sup>b</sup>	5.80E-05 <sup>a</sup>	C <sup>a</sup>
000079-46-9	NITROPROPANE, 2-	NA	NA	9.50E+00 <sup>b</sup>	NA	2.00E-02 <sup>a</sup>	2.00E-02 <sup>b</sup>	9.40E+00 <sup>b</sup>	2.70E+03 <sup>b</sup>	B2 <sup>b</sup>
000080-05-7	BISPHENOL A	5.00E-02 <sup>a</sup>	6.00E-01 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
000080-62-6	METHYL METHACRYLATE	8.00E-02 <sup>b</sup>	8.00E-02 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
000081-81-2	WARFARIN	3.00E-04 <sup>a</sup>	3.00E-04 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
000082-68-8	PENTACHLORONITROBENZENE	3.00E-03 <sup>a</sup>	3.00E-03 <sup>b</sup>	2.60E-01 <sup>b</sup>	7.40E-06 <sup>b</sup>	NA	NA	NA	NA	C <sup>b</sup>
000083-32-9	ACENAPHTHENE	6.00E-02 <sup>a</sup>	6.00E-01 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
000083-79-4	ROTELONE	4.00E-03 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
000084-66-2	DIETHYL PHTHALATE	8.00E-01 <sup>a</sup>	8.00E+00 <sup>b</sup>	NA	NA	NA	NA	NA	NA	D <sup>a</sup>

**SUMMARY OF REFERENCE DOSES (RfD), REFERENCE CONCENTRATIONS (RfC), SLOPE FACTORS ( $q_1^*$ ),  
UNIT RISKS, AND EPA CANCER CLASSIFICATION FROM IRIS AND HEAST IN CAS NUMBER ORDER**

CAS Number	Chemical	Oral RfD (mg/kg/day)		Oral Slope Factor (mg/kg/day) <sup>-1</sup>	Oral Unit Risk (µg/L) <sup>-1</sup>	Inhalation RfC (mg/m <sup>3</sup> )		Inhalation Slope Factor (mg/kg/day) <sup>-1</sup>	Inhalation Unit Risk (µg/m <sup>3</sup> ) <sup>-1</sup>	EPA Class
		Chronic	Subchronic			Chronic	Subchronic			
000084-72-0	ETHYLPHTHALYL ETHYL GLYCOLATE	3.00E+00 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
000084-74-2	DIBUTYL PHTHALATE	1.00E-01 <sup>a</sup>	1.00E+00 <sup>b</sup>	NA	NA	NA	NA	NA	NA	D <sup>a</sup>
000085-00-7	DIQUAT	2.20E-03 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	D <sup>a</sup>
000085-01-8	PHENANTHRENE	NA	NA	NA	NA	NA	NA	NA	NA	D <sup>a</sup>
000085-44-9	PHTHALIC ANHYDRIDE	2.00E+00 <sup>a</sup>	2.00E+00 <sup>b</sup>	NA	NA	1.20E-01 <sup>b</sup>	1.20E-01 <sup>b</sup>	NA	NA	NA
000085-68-7	BUTYL BENZYL PHTHALATE	2.00E-01 <sup>a</sup>	2.00E+00 <sup>b</sup>	NA	NA	NA	NA	NA	NA	C <sup>b</sup>
000085-70-1	BUTYLPHTHALYL BUTYLGLYCOLATE	1.00E+00 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
000086-30-6	NITROSODIPHENYLAMINE, N-	NA	NA	4.90E-03 <sup>a</sup>	1.40E-07 <sup>a</sup>	NA	NA	NA	NA	B2 <sup>a</sup>
000086-73-7	FLUORENE	4.00E-02 <sup>a</sup>	4.00E-01 <sup>b</sup>	NA	NA	NA	NA	NA	NA	D <sup>a</sup>
000086-74-8	CARBAZOLE	NA	NA	2.00E-02 <sup>b</sup>	5.70E-07 <sup>b</sup>	NA	NA	NA	NA	B2 <sup>b</sup>
000087-68-3	HEXACHLOROBUTADIENE	2.00E-04 <sup>b</sup>	NA	7.80E-02 <sup>a</sup>	2.20E-06 <sup>a</sup>	NA	NA	7.80E-02 <sup>b</sup>	2.20E-05 <sup>a</sup>	C <sup>a</sup>
000087-82-1	HEXBROMOBENZENE	2.00E-03 <sup>a</sup>	2.00E-02 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
000087-84-3	CYCLOHEXANE, 1,2,3,4,5-PENTABROMO-6-CHLORO	NA	NA	2.30E-02 <sup>b</sup>	6.80E-07 <sup>b</sup>	NA	NA	NA	NA	C <sup>b</sup>
000087-86-5	PENTACHLOROPHENOL	3.00E-02 <sup>a</sup>	3.00E-02 <sup>b</sup>	1.20E-01 <sup>a</sup>	3.00E-06 <sup>a</sup>	NA	NA	NA	NA	B2 <sup>a</sup>
000088-06-2	TRICHLOROPHENOL, 2,4,6-	NA	NA	1.10E-02 <sup>a</sup>	3.10E-07 <sup>a</sup>	NA	NA	1.00E-02 <sup>b</sup>	3.10E-06 <sup>a</sup>	B2 <sup>a</sup>
000088-72-2	NITROTOLUENE, o-	1.00E-02 <sup>b</sup>	1.00E-01 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
000088-73-3	CHLORONITROBENZENE, o-	NA	NA	2.50E-02 <sup>b</sup>	7.10E-07 <sup>b</sup>	NA	NA	NA	NA	B2 <sup>b</sup>
000088-74-4	NITROANILINE, 2-	NA	NA	NA	NA	2.00E-04 <sup>b</sup>	2.00E-03 <sup>b</sup>	NA	NA	NA
000088-85-7	DINOSEB	1.00E-03 <sup>a</sup>	1.00E-03 <sup>b</sup>	NA	NA	NA	NA	NA	NA	D <sup>a</sup>
000090-43-7	PHENYLPHENOL, 2-	NA	NA	1.94E-03 <sup>b</sup>	5.50E-08 <sup>b</sup>	NA	NA	NA	NA	C <sup>b</sup>
000091-20-3	NAPHTHALENE	NA <sup>a</sup>	NA <sup>a</sup>	NA	NA	NA	NA	NA	NA	D <sup>a</sup>
000091-22-5	QUINOLINE	NA	NA	1.20E+01 <sup>b</sup>	3.50E-04 <sup>b</sup>	NA	NA	NA	NA	C <sup>b</sup>
000091-58-7	CHLORONAPHTHALENE, BETA-	8.00E-02 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA	NA
000091-94-1	DICHLOROBENZIDINE, 3,3'-	NA	NA	4.50E-01 <sup>a</sup>	1.30E-05 <sup>a</sup>	NA	NA	NA	NA	B2 <sup>a</sup>
000092-52-4	BIPHENYL, 1,1'-	5.00E-02 <sup>a</sup>	5.00E-02 <sup>b</sup>	NA	NA	NA	NA	NA	NA	D <sup>a</sup>

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UNIT RISKS, AND EPA CANCER CLASSIFICATION FROM IRIS AND HEAST IN CAS NUMBER ORDER**

CAS Number	Chemical	Oral RfD (mg/kg/day)		Oral Slope Factor (mg/kg/day) <sup>-1</sup>	Oral Unit Risk (µg/L) <sup>-1</sup>	Inhalation RfC (mg/m <sup>3</sup> )		Inhalation Slope Factor (mg/kg/day) <sup>-1</sup>	Inhalation Unit Risk (µg/m <sup>3</sup> ) <sup>-1</sup>	EPA Class
		Chronic	Subchronic			Chronic	Subchronic			
000092-87-5	BENZIDINE	3.00E-03 <sup>a</sup>	3.00E-03 <sup>b</sup>	2.30E+02 <sup>a</sup>	6.70E-03 <sup>a</sup>	NA	NA	2.30E+02 <sup>b</sup>	6.70E-02 <sup>a</sup>	A <sup>a</sup>
000093-65-2	MCPP	1.00E-03 <sup>a</sup>	1.00E-02 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
000093-72-1	TRICHLOROPHOXY) PROPIONIC ACID, 2(4,5-	8.00E-03 <sup>a</sup>	8.00E-03 <sup>b</sup>	NA	NA	NA	NA	NA	NA	D <sup>a</sup>
000093-76-5	TRICHLOROPHOXYACETIC ACID, 2,4,5-	1.00E-02 <sup>a</sup>	1.00E-01 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
000094-74-6	MCPA	5.00E-04 <sup>a</sup>	5.00E-04 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
000094-75-7	DICHLOROPHOXY ACETIC ACID, 2,4-	1.00E-02 <sup>a</sup>	1.00E-02 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
000094-81-5	MCPB	1.00E-02 <sup>a</sup>	1.00E-01 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
000094-82-6	DICHLOROPHOXYBUTYRIC ACID, 4-(2,4-	8.00E-03 <sup>a</sup>	8.00E-02 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
000095-47-6	XYLENE, o-	2.00E+00 <sup>b</sup>	NA <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA
000095-48-7	CRESOL, o-	5.00E-02 <sup>a</sup>	5.00E-01 <sup>b</sup>	NA	NA	NA	NA	NA	NA	C <sup>a</sup>
000095-49-8	CHLOROTOLUENE, o-	2.00E-02 <sup>a</sup>	2.00E-01 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
000095-50-1	DICHLOROBENZENE, 1,2-	8.00E-02 <sup>b</sup>	8.00E-01 <sup>a,b,e</sup>	NA	NA	2.00E-01 <sup>b,c</sup>	2.00E+00 <sup>b</sup>	NA	NA	D <sup>a</sup>
000095-53-4	TOLUIDINE, o-(METHYLANILINE, 2-)	NA	NA	2.40E-01 <sup>b</sup>	6.90E-06 <sup>b</sup>	NA	NA	NA	NA	B2 <sup>b</sup>
000095-54-5	PHENYLENEDIAMINE, o-	NA	NA	4.70E-02 <sup>b</sup>	1.30E-06 <sup>b</sup>	NA	NA	NA	NA	B2 <sup>b</sup>
000095-57-8	CHLOROPHENOL, 2-	5.00E-03 <sup>a</sup>	5.00E-02 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
000095-65-8	DIMETHYLPHENOL, 3,4-	1.00E-03 <sup>a</sup>	1.00E-02 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
000095-68-1	DIMETHYLANILINE, 2,4-	NA	NA	7.50E-01 <sup>b</sup>	2.10E-05 <sup>b</sup>	NA	NA	NA	NA	C <sup>b</sup>
000095-69-2	CHLORO-2-METHYLANILINE, 4-	NA	NA	5.80E-01 <sup>b</sup>	1.60E-05 <sup>b</sup>	NA	NA	NA	NA	B2 <sup>b</sup>
000095-70-5	TOLUENE-2,5-DIAMINE	8.00E-01 <sup>b</sup>	8.00E-01 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
000095-80-7	TOLUENE-2,4-DIAMINE	NA	NA	3.20E+00 <sup>b</sup>	9.10E-05 <sup>b</sup>	NA	NA	NA	NA	B2 <sup>b</sup>
000095-94-3	TETRACHLOROBENZENE, 1,2,4,5-	3.00E-04 <sup>a</sup>	3.00E-03 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
000095-95-4	TRICHLOROPHENOL, 2,4,5-	1.00E-01 <sup>a</sup>	1.00E+00 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
000096-12-8	DIBROMO-3-CHLOROPROPANE, 1,2-	NA	NA	1.40E+00 <sup>b</sup>	4.00E-05 <sup>a</sup>	2.00E-04 <sup>a</sup>	NA	2.40E-03 <sup>b</sup>	6.90E-07 <sup>b</sup>	B2 <sup>b</sup>
000096-18-4	TRICHLOROPROPANE, 1,2,3-	8.00E-03 <sup>a</sup>	8.00E-02 <sup>b</sup>	7.00E+00 <sup>b</sup>	2.00E-04 <sup>b</sup>	NA	NA	NA	NA	B2 <sup>b</sup>
000096-19-5	TRICHLOROPROPENE, 1,2,3-	5.00E-03 <sup>b</sup>	5.00E-03 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA

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		Chronic	Subchronic			Chronic	Subchronic			
000096-33-3	METHYL ACRYLATE	3.00E-02 <sup>b,c</sup>	3.00E-02 <sup>b,c</sup>	NA	NA	NA	NA	NA	NA	D <sup>a</sup>
000096-45-7	ETHYLENE THIOUREA	8.00E-05 <sup>a</sup>	8.00E-05 <sup>b</sup>	1.10E-01 <sup>b</sup>	3.40E-06 <sup>b</sup>	NA	NA	NA	NA	B2 <sup>b</sup>
000097-63-2	ETHYL METHACRYLATE	9.00E-02 <sup>b</sup>	9.00E-02 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
000098-01-1	FURFURAL	3.00E-03 <sup>a</sup>	3.00E-02 <sup>b</sup>	NA	NA	5.00E-02 <sup>b,c</sup>	5.00E-01 <sup>b,c</sup>	NA	NA	NA
000098-07-7	BENZOTRICHLORIDE	NA	NA	1.30E+01 <sup>a</sup>	3.60E-04 <sup>a</sup>	NA	NA	NA	NA	B2 <sup>a</sup>
000098-56-6	CHLOROBENZOTRIFLUORIDE, 4-	2.00E-02 <sup>b</sup>	2.00E-01 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
000098-82-8	CUMENE	4.00E-02 <sup>a</sup>	4.00E-01 <sup>b</sup>	NA	NA	9.00E-03 <sup>b</sup>	9.00E-02 <sup>b</sup>	NA	NA	NA
000098-83-9	METHYLSYRENE, ALPHA-	7.00E-02 <sup>b,c</sup>	7.00E-01 <sup>b,c</sup>	NA	NA	NA	NA	NA	NA	NA
000098-86-2	ACETOPHENONE	1.00E-01 <sup>a</sup>	1.00E+00 <sup>b</sup>	NA	NA	NA	NA	NA	NA	D <sup>a</sup>
000098-95-3	NITROBENZENE	5.00E-04 <sup>b</sup>	5.00E-03 <sup>b</sup>	NA	NA	2.00E-03 <sup>b,c</sup>	2.00E-02 <sup>b,c</sup>	NA	NA	D <sup>a</sup>
000099-08-1	NITROTOLUENE, m-	1.00E-02 <sup>b</sup>	1.00E-01 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
000099-35-4	TRINITROBENZENE, 1,3,5-	5.00E-05 <sup>b</sup>	5.00E-04 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
000099-55-8	METHYL-5-NITROANILINE, 2-	NA	NA	3.30E-02 <sup>b</sup>	9.40E-07 <sup>b</sup>	NA	NA	NA	NA	C <sup>b</sup>
000099-59-2	METHOXY-5-NITROANILINE, 2-	NA	NA	4.60E-02 <sup>b</sup>	1.30E-06 <sup>b</sup>	NA	NA	NA	NA	B2 <sup>b</sup>
000099-65-0	DINITROBENZENE, 1,3-	1.00E-04 <sup>a</sup>	1.00E-03 <sup>b</sup>	NA	NA	NA	NA	NA	NA	D <sup>a</sup>
000099-99-0	NITROTOLUENE, p-	1.00E-02 <sup>b</sup>	1.00E-01 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
000100-21-0	PHTHALIC ACID, p-	1.00E+00 <sup>b</sup>	1.00E+00 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
000100-25-4	DINITROBENZENE, 1,4-	4.00E-04 <sup>b</sup>	4.00E-03 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
000100-41-4	ETHYLBENZENE	1.00E-01 <sup>b</sup>	NA <sup>e</sup>	NA	NA	1.00E+00 <sup>a</sup>	NA <sup>e</sup>	NA	NA	D <sup>a</sup>
000100-42-5	STYRENE	2.00E-01 <sup>a</sup>	NA <sup>e</sup>	NA <sup>e</sup>	NA	1.00E+00 <sup>a</sup>	3.00E+00 <sup>b</sup>	NA <sup>e</sup>	NA	NA <sup>a</sup>
000100-44-7	BENZYL CHLORIDE	NA	NA	1.70E-01 <sup>a</sup>	4.90E-06 <sup>a</sup>	NA	NA	NA	NA	B2 <sup>a</sup>
000100-51-8	BENZYL ALCOHOL	3.00E-01 <sup>b</sup>	1.00E+00 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
000100-52-7	BENZALDEHYDE	1.00E-01 <sup>a</sup>	1.00E+00 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
000101-14-4	METHYLENE-BIS(2-CHLOROANILINE), 4,4'-	7.00E-04 <sup>b</sup>	7.00E-04 <sup>b</sup>	1.30E-01 <sup>b</sup>	3.70E-06 <sup>b</sup>	NA	NA	1.30E-01 <sup>b</sup>	3.70E-05 <sup>b</sup>	B2 <sup>b</sup>
000101-21-3	CHLORPROPHAM	2.00E-01 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA

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		Chronic	Subchronic			Chronic	Subchronic			
000101-55-3	BROMODIPHENYL ETHER, p-	NA	NA	NA	NA	NA	NA	NA	NA	D <sup>a</sup>
000101-61-1	METHYLENE-BIS(N,N-DIMETHYL) ANILINE, 4,4'-	NA	NA	4.60E-02 <sup>a</sup>	1.30E-06 <sup>a</sup>	NA	NA	NA	NA	B2 <sup>a</sup>
000101-68-8	METHYLEDIPHENYL ISOCYANATE, 4,4'-	NA	NA	NA	NA	2.00E-05 <sup>a</sup>	2.00E-05 <sup>b</sup>	NA	NA	NA
000101-77-9	METHYLENEBISBENZENAMINE, 4,4'-	NA	NA	NA	NA	NA	NA	NA	NA	NA
000103-23-1	DI(2-ETHYLHEXYL)ADIPATE	NA	NA	1.20E-03 <sup>a</sup>	3.40E-08 <sup>a</sup>	NA	NA	NA	NA	C <sup>a</sup>
000103-33-3	AZOBENZENE	NA	NA	1.10E-01 <sup>a</sup>	3.10E-06 <sup>a</sup>	NA	NA	1.10E-01 <sup>b</sup>	3.10E-05 <sup>a</sup>	B2 <sup>a</sup>
000105-60-2	CAPROLACTAM	5.00E-01 <sup>a</sup>	5.00E-01 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
000105-67-9	DIMETHYLPHENOL, 2,4-	2.00E-02 <sup>a</sup>	2.00E-01 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
000106-37-6	DIBROMOBENZENE, 1,4-	1.00E-02 <sup>a</sup>	1.00E-01 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
000106-42-3	XYLENE, p-	NA	NA	NA	NA	NA	NA	NA	NA	NA
000106-44-6	CRESOL, p-	5.00E-03 <sup>b</sup>	5.00E-03 <sup>b</sup>	NA	NA	NA	NA	NA	NA	C <sup>b</sup>
000106-46-7	DICHLOROBENZENE, 1,4-	NA	NA	2.40E-02 <sup>b</sup>	6.80E-07 <sup>b</sup>	8.00E-01 <sup>a</sup>	2.50E+00 <sup>b</sup>	NA	NA	B2 <sup>a</sup>
000106-47-8	CHLOROANILINE, p-	4.00E-03 <sup>a</sup>	4.00E-03 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
000106-49-0	TOLUIDINE, p-	NA	NA	1.90E-01 <sup>b</sup>	5.40E-06 <sup>b</sup>	NA	NA	NA	NA	C <sup>b</sup>
000106-50-3	PHENYLENEDIAMINE, p-	1.90E-01 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA	NA
000106-88-7	EPOXYBUTANE, 1,2-	NA	NA	NA	NA	2.00E-02 <sup>a</sup>	NA	NA	NA	NA
000106-89-8	EPICHLOROHYDRIN	2.00E-03 <sup>b</sup>	2.00E-03 <sup>b</sup>	9.90E-03 <sup>a</sup>	2.80E-07 <sup>a</sup>	1.00E-03 <sup>a</sup>	1.00E-02 <sup>b</sup>	4.20E-03 <sup>b</sup>	1.20E-06 <sup>a</sup>	B2 <sup>a</sup>
000106-93-4	DIBROMOETHANE, 1,2-	NA	NA	8.50E+01 <sup>a</sup>	2.50E-03 <sup>a</sup>	2.00E-04 <sup>b</sup>	2.00E-03 <sup>b</sup>	7.80E-01 <sup>b</sup>	2.20E-04 <sup>a</sup>	B2 <sup>a</sup>
000106-99-0	BUTADIENE, 1,3-	NA	NA	NA	NA	NA	NA	1.80E+00 <sup>b</sup>	2.80E-04 <sup>a</sup>	B2 <sup>a</sup>
000107-02-8	ACROLEIN	NA <sup>c</sup>	NA <sup>c</sup>	NA	NA	2.00E-05 <sup>a</sup>	NA <sup>c</sup>	NA	NA	C <sup>a</sup>
000107-05-1	ALLYL CHLORIDE	NA	NA	NA	NA	1.00E-03 <sup>a</sup>	1.00E-02 <sup>b</sup>	NA	NA	C <sup>a</sup>
000107-06-2	DICHLOROETHANE, 1,2-	NA	NA <sup>c</sup>	9.10E-02 <sup>a</sup>	2.60E-06 <sup>a</sup>	NA	NA	9.10E-02 <sup>b</sup>	2.60E-05 <sup>a</sup>	B2 <sup>a</sup>
000107-13-1	ACRYLONITRILE	1.00E-03 <sup>b</sup>	1.00E-02 <sup>b</sup>	5.40E-01 <sup>a</sup>	1.50E-05 <sup>a</sup>	2.00E-03 <sup>a</sup>	NA	2.40E-01 <sup>b</sup>	6.80E-05 <sup>a</sup>	B1 <sup>a</sup>
000107-15-3	ETHYLENE DIAMINE	2.00E-02 <sup>b</sup>	2.00E-01 <sup>b</sup>	NA	NA	NA	NA	NA	NA	D <sup>a</sup>
000107-18-6	ALLYL ALCOHOL	5.00E-03 <sup>a</sup>	5.00E-02 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA

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CAS Number	Chemical	Oral RfD (mg/kg/day)		Oral Slope Factor (mg/kg/day) <sup>-1</sup>	Oral Unit Risk (µg/L) <sup>-1</sup>	Inhalation RfC (mg/m <sup>3</sup> )		Inhalation Slope Factor (mg/kg/day) <sup>-1</sup>	Inhalation Unit Risk (µg/m <sup>3</sup> ) <sup>-1</sup>	EPA Class
		Chronic	Subchronic			Chronic	Subchronic			
000107-19-7	PROPARGYL ALCOHOL	2.00E-03 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
000107-21-1	ETHYLENE GLYCOL	2.00E+00 <sup>a</sup>	2.00E+00 <sup>b</sup>	NA	NA	NA	NA	NA	NA	D <sup>a</sup>
000107-30-2	CHLOROMETHYL METHYL ETHER	NA	NA	NA	NA	NA	NA	NA	NA	A <sup>a</sup>
000107-98-2	PROPYLENE GLYCOL MONOMETHYL ETHER	7.00E-01 <sup>b</sup>	7.00E+00 <sup>b</sup>	NA	NA	2.00E+00 <sup>a</sup>	2.00E+01 <sup>b</sup>	NA	NA	NA
000108-05-4	VINYL ACETATE	1.00E+00 <sup>b</sup>	1.00E+00 <sup>b</sup>	NA	NA	2.00E-01 <sup>a</sup>	2.00E-01 <sup>b</sup>	NA	NA	NA
000108-06-1	BIS(2-CHLORO-1-METHYLETHYL)ETHER (TECHNICAL)	NA	NA	7.00E-02 <sup>b</sup>	2.00E-06 <sup>b</sup>	NA	NA	3.50E-02 <sup>b</sup>	1.00E-05 <sup>b</sup>	C <sup>b</sup>
000108-10-1	METHYL ISOBUTYL KETONE	8.00E-02 <sup>b</sup>	8.00E-01 <sup>b</sup>	NA	NA	8.00E-02 <sup>b,c</sup>	8.00E-01 <sup>b,c</sup>	NA	NA	NA
000108-31-6	MALEIC ANHYDRIDE	1.00E-01 <sup>a</sup>	1.00E-01 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
000108-38-3	XYLENE, m-	2.00E+00 <sup>b</sup>	NA <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA
000108-39-4	CRESOL, m-	5.00E-02 <sup>a</sup>	5.00E-01 <sup>b</sup>	NA	NA	NA	NA	NA	NA	C <sup>a</sup>
000108-45-2	PHENYLENEDIAMINE, m-	6.00E-03 <sup>a</sup>	6.00E-02 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
000108-87-2	METHYLCYCLOHEXANE	NA	NA	NA	NA	3.00E+00 <sup>b</sup>	3.00E+00 <sup>b</sup>	NA	NA	NA
000108-88-3	TOLUENE	2.00E-01 <sup>a</sup>	2.00E+00 <sup>b</sup>	NA	NA	4.00E-01 <sup>a</sup>	4.00E-01 <sup>b,e</sup>	NA	NA	D <sup>a</sup>
000108-90-7	CHLOROBENZENE	2.00E-02 <sup>a</sup>	2.00E-01 <sup>b,e</sup>	NA	NA	2.00E-02 <sup>b,c</sup>	NA <sup>e</sup>	NA	NA	D <sup>a</sup>
000108-91-8	CYCLOHEXYLAMINE	2.00E-01 <sup>a</sup>	3.00E-01 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
000108-94-1	CYCLOHEXANONE	5.00E+00 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
000108-95-2	PHENOL	6.00E-01 <sup>a</sup>	6.00E-01 <sup>b</sup>	NA	NA	NA	NA	NA	NA	D <sup>a</sup>
000108-98-5	BENZENETHIOL	1.00E-05 <sup>b</sup>	1.00E-04 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
000109-89-3	CHLOROBUTANE, 1-	4.00E-01 <sup>b</sup>	8.00E-01 <sup>b</sup>	NA	NA	NA	NA	NA	NA	D <sup>a</sup>
000109-77-3	MALONONITRILE	2.00E-05 <sup>b</sup>	2.00E-04 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
000109-78-4	ETHYLENE CYANOHYDRIN	3.00E-01 <sup>b</sup>	3.00E-01 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
000109-88-4	METHOXYETHANOL, 2-	1.00E-03 <sup>b,c</sup>	1.00E-02 <sup>b,c</sup>	NA	NA	2.00E-02 <sup>a</sup>	2.00E-01 <sup>b</sup>	NA	NA	NA
000110-00-8	FURAN	1.00E-03 <sup>a</sup>	1.00E-02 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
000110-49-8	METHOXYETHANOL ACETATE, 2-	2.00E-03 <sup>b,c</sup>	2.00E-02 <sup>b,c</sup>	NA	NA	NA	NA	NA	NA	NA
000110-54-3	HEXANE, N-	6.00E-02 <sup>b</sup>	6.00E-01 <sup>b</sup>	NA	NA	2.00E-01 <sup>a</sup>	2.00E-01 <sup>b</sup>	NA	NA	D <sup>a</sup>

**SUMMARY OF REFERENCE DOSES (RfD), REFERENCE CONCENTRATIONS (RfC), SLOPE FACTORS ( $q_1^*$ ),  
UNIT RISKS, AND EPA CANCER CLASSIFICATION FROM IRIS AND HEAST IN CAS NUMBER ORDER**

CAS Number	Chemical	Oral RfD (mg/kg/day)		Oral Slope Factor (mg/kg/day) <sup>-1</sup>	Oral Unit Risk (µg/L) <sup>-1</sup>	Inhalation RfC (mg/m <sup>3</sup> )		Inhalation Slope Factor (mg/kg/day) <sup>-1</sup>	Inhalation Unit Risk (µg/m <sup>3</sup> ) <sup>-1</sup>	EPA Class
		Chronic	Subchronic			Chronic	Subchronic			
000110-80-5	ETHOXYETHANOL, 2-	4.00E-01 <sup>b</sup>	5.00E-01 <sup>b</sup>	NA	NA	2.00E-01 <sup>a</sup>	2.00E+00 <sup>b</sup>	NA	NA	NA
000110-86-1	PYRIDINE	1.00E-03 <sup>a</sup>	1.00E-02 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
000111-15-9	ETHOXYETHANOL ACETATE, 2-	3.00E-01 <sup>b,c</sup>	3.00E-01 <sup>b,c</sup>	NA	NA	NA	NA	NA	NA	NA
000111-44-4	BIS(2-CHLOROETHYL)ETHER	NA	NA	1.10E+00 <sup>a</sup>	3.30E-05 <sup>a</sup>	NA	NA	1.10E+00 <sup>b</sup>	3.30E-04 <sup>a</sup>	B2
000111-76-2	ETHYLENE GLYCOL MONOBUTYL ETHER	NA	NA	NA	NA	2.00E-02 <sup>b</sup>	2.00E-01 <sup>b</sup>	NA	NA	NA
000111-90-0	DIETHYLENE GLYCOL MONOETHYL ETHER	2.00E+00 <sup>b</sup>	5.00E+00 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
000111-91-1	BIS(2-CHLOROETHOXY)METHANE	NA	NA	NA	NA	NA	NA	NA	NA	D <sup>a</sup>
000112-34-5	DIETHYLENE GLYCOL MONOBUTYL ETHER	NA	NA	NA	NA	2.00E-02 <sup>b</sup>	2.00E-01 <sup>b</sup>	NA	NA	NA
000114-26-1	BAYGON	4.00E-03 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
000115-29-7	ENDOSULFAN	6.00E-03 <sup>a</sup>	6.00E-03 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
000115-32-2	DICOFOL	NA	NA	NA	NA	NA	NA	NA	NA	D <sup>b</sup>
000116-06-3	ALDICARB	1.00E-03 <sup>a</sup>	1.00E-03 <sup>b</sup>	NA	NA	NA	NA	NA	NA	D <sup>a</sup>
000117-81-7	BIS(2-ETHYLHEXYL)PHTHALATE	2.00E-02 <sup>a</sup>	2.00E-02 <sup>b,e</sup>	1.40E-02 <sup>a</sup>	4.00E-07 <sup>a</sup>	NA	NA	NA	NA	B2
000117-84-0	OCTYL PHTHALATE, DI-N-	2.00E-02 <sup>b</sup>	2.00E-02 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
000118-74-1	HEXACHLOROBENZENE	8.00E-04 <sup>a</sup>	NA <sup>e</sup>	1.80E+00 <sup>a</sup>	4.80E-05 <sup>a</sup>	NA	NA	1.60E+00 <sup>b</sup>	4.80E-04 <sup>a</sup>	B2
000118-75-2	CHLORANIL	NA	NA	4.03E-01 <sup>b</sup>	1.20E-05 <sup>b</sup>	NA	NA	NA	NA	C <sup>b</sup>
000118-96-7	TRINITROTOLUENE, 2,4,6-	5.00E-04 <sup>a</sup>	5.00E-04 <sup>b</sup>	3.00E-02 <sup>a</sup>	9.00E-07 <sup>a</sup>	NA	NA	NA	NA	C <sup>a</sup>
000119-90-4	DIMETHOXYBENZIDINE, 3,3'-	NA	NA	1.40E-02 <sup>b</sup>	4.00E-07 <sup>b</sup>	NA	NA	NA	NA	B2
000119-93-7	DIMETHYLBENZIDINE, 3,3'-	NA	NA	9.20E+00 <sup>b</sup>	2.60E-04 <sup>b</sup>	NA	NA	NA	NA	B2
000120-12-7	ANTHRACENE	3.00E-01 <sup>a</sup>	3.00E+00 <sup>b</sup>	NA	NA	NA	NA	NA	NA	D <sup>b</sup>
000120-61-8	DIMETHYLTEREPHTHALATE	1.00E-01 <sup>a</sup>	1.00E-01 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
000120-82-1	TRICHLOROBENZENE, 1,2,4-	1.00E-02 <sup>a</sup>	1.00E-02 <sup>b</sup>	NA	NA	2.00E-01 <sup>b</sup>	2.00E+00 <sup>b</sup>	NA	NA	D <sup>b</sup>
000120-83-2	DICHLOROPHENOL, 2,4-	3.00E-03 <sup>a</sup>	3.00E-03 <sup>b</sup>	NA	NA	NA	NA	NA	NA	D <sup>a</sup>
000121-14-2	DINITROTOLUENE, 2,4-	2.00E-03 <sup>a</sup>	2.00E-03 <sup>b</sup>	6.80E-01 <sup>b,g</sup>	1.80E-05 <sup>a</sup>	NA	NA	NA	NA	B2
000121-44-8	TRIETHYLAMINE	NA	NA	NA	NA	7.00E-03 <sup>a</sup>	NA	NA	NA	NA

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CAS Number	Chemical	Oral RfD (mg/kg/day)		Oral Slope Factor (mg/kg/day) <sup>-1</sup>	Oral Unit Risk (µg/L) <sup>-1</sup>	Inhalation RfC (mg/m <sup>3</sup> )		Inhalation Slope Factor (mg/kg/day) <sup>-1</sup>	Inhalation Unit Risk (µg/m <sup>3</sup> ) <sup>-1</sup>	EPA Class
		Chronic	Subchronic			Chronic	Subchronic			
000121-69-7	DIMETHYLANILINE, N,N-	2.00E-03 <sup>a</sup>	2.00E-02 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
000121-73-3	CHLORONITROBENZENE, p-	NA	NA	1.80E-02 <sup>b</sup>	5.10E-07 <sup>b</sup>	NA	NA	NA	NA	B2
000121-75-5	MALATHION	2.00E-02 <sup>a</sup>	2.00E-02 <sup>b</sup>	NA	NA	NA	NA	NA	NA	D <sup>a</sup>
000121-82-4	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE (RDX)	3.00E-03 <sup>a</sup>	3.00E-03 <sup>b</sup>	1.10E-01 <sup>a</sup>	3.10E-06 <sup>a</sup>	NA	NA	NA	NA	C <sup>a</sup>
000122-34-9	SIMAZINE	5.00E-03	5.00E-03	1.20E-01 <sup>b</sup>	3.40E-06 <sup>b</sup>	NA	NA	NA	NA	C
000122-39-4	DIPHENYLAMINE	2.50E-02 <sup>b</sup>	2.50E-02 <sup>b</sup>	NA	NA	NA	NA	NA	NA	D <sup>a</sup>
000122-42-9	PROPHAM	2.00E-02 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
000122-66-7	DIPHENYLHYDRAZINE, 1,2-	NA	NA	8.00E-01 <sup>a</sup>	2.20E-05 <sup>a</sup>	NA	NA	8.00E-01 <sup>b</sup>	2.20E-04 <sup>a</sup>	B2 <sup>a</sup>
000123-09-1	CHLOROPHENYL METHYL SULFIDE, p-	NA	NA	NA	NA	NA	NA	NA	NA	D <sup>a</sup>
000123-31-8	HYDROQUINONE	4.00E-02 <sup>b</sup>	4.00E-01 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
000123-33-1	MALEIC HYDRAZIDE	5.00E-01 <sup>a</sup>	5.00E-01 <sup>b</sup>	NA	NA	NA	NA	NA	NA	D <sup>a</sup>
000123-73-9	CROTONALDEHYDE	NA	NA	1.80E+00 <sup>b</sup>	5.40E-05 <sup>b</sup>	NA	NA	NA	NA	C <sup>a</sup>
000123-91-1	DIOXANE, 1,4-	NA	NA	1.10E-02 <sup>a</sup>	3.10E-07 <sup>a</sup>	NA	NA	NA	NA	B2 <sup>a</sup>
000124-48-1	DIBROMOCHLOROMETHANE	2.00E-02 <sup>a</sup>	2.00E-01 <sup>b</sup>	8.40E-02 <sup>a</sup>	2.40E-06 <sup>a</sup>	NA	NA	NA	NA	B2 <sup>a</sup>
000126-98-7	METHACRYLONITRILE	1.00E-04 <sup>a</sup>	1.00E-03 <sup>b</sup>	NA	NA	7.00E-04 <sup>b,c</sup>	7.00E-03 <sup>b,c</sup>	NA	NA	NA
000126-99-8	CHLORO-1,3-BUTADIENE, 2-	2.00E-02 <sup>b,c</sup>	2.00E-02 <sup>b,c</sup>	NA	NA	7.00E-03 <sup>b</sup>	7.00E-02 <sup>b</sup>	NA	NA	NA
000127-18-4	TETRACHLOROETHYLENE	1.00E-02 <sup>a</sup>	1.00E-01 <sup>b</sup>	NA <sup>a</sup>	NA	NA	NA	NA	NA	NA <sup>a</sup>
000129-00-0	PYRENE	3.00E-02 <sup>a</sup>	3.00E-01 <sup>b</sup>	NA	NA	NA	NA	NA	NA	D <sup>a</sup>
000131-11-3	DIMETHYLPHthalATE	NA	NA	NA	NA	NA	NA	NA	NA	D <sup>a</sup>
000131-89-5	DINITRO-O-CYCLOHEXYL PHENOL, 4,6-	2.00E-03 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
000133-06-2	CAPTAN	1.30E-01 <sup>a</sup>	1.30E-01 <sup>b</sup>	3.50E-03 <sup>b</sup>	1.00E-07 <sup>b</sup>	NA	NA	NA	NA	B2
000133-07-3	FOLPET	1.00E-01 <sup>a</sup>	1.00E-01 <sup>b</sup>	3.50E-03 <sup>a</sup>	1.00E-07 <sup>a</sup>	NA	NA	NA	NA	B2 <sup>a</sup>
000133-90-4	CHLORAMBEN	1.50E-02 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA	NA
000137-26-8	THIRAM	5.00E-03 <sup>a</sup>	6.00E-03 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
000139-40-2	PROPАЗINE	2.00E-02 <sup>a</sup>	2.00E-02 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA

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CAS Number	Chemical	Oral RfD (mg/kg/day)		Oral Slope Factor (mg/kg/day) <sup>-1</sup>	Oral Unit Risk (µg/L) <sup>-1</sup>	Inhalation RfC (mg/m <sup>3</sup> )		Inhalation Slope Factor (mg/kg/day) <sup>-1</sup>	Inhalation Unit Risk (µg/m <sup>3</sup> ) <sup>-1</sup>	EPA Class
		Chronic	Subchronic			Chronic	Subchronic			
000140-57-8	ARAMITE	5.00E-02 <sup>b</sup>	1.00E-01 <sup>b</sup>	2.50E-02 <sup>a</sup>	7.10E-07 <sup>a</sup>	NA	NA	2.50E-02 <sup>b</sup>	7.10E-06 <sup>a</sup>	B2 <sup>a</sup>
000140-88-5	ETHYL ACRYLATE	NA	NA	4.80E-02 <sup>b</sup>	1.40E-06 <sup>b</sup>	NA	NA	NA	NA	B2 <sup>b</sup>
000141-66-2	BIDRIN	1.00E-04 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
000141-78-6	ETHYL ACETATE	9.00E-01 <sup>a</sup>	9.00E+00 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
000142-82-5	HEPTANE, N-	NA	NA	NA	NA	NA	NA	NA	NA	D <sup>a</sup>
000143-33-8	SODIUM CYANIDE	4.00E-02 <sup>a</sup>	4.00E-02 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
000145-73-3	ENDOTHALL	2.00E-02 <sup>a</sup>	2.00E-02 <sup>b</sup>	NA	NA	NA	NA	NA	NA	D <sup>a</sup>
000148-18-5	SODIUM DIETHYLDITHIOCARBAMATE	3.00E-02 <sup>a</sup>	3.00E-01 <sup>b</sup>	2.70E-01 <sup>b</sup>	7.70E-06 <sup>b</sup>	NA	NA	NA	NA	C <sup>b</sup>
000150-50-5	MERPHOS	3.00E-05 <sup>a</sup>	3.00E-04 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
000151-50-8	POTASSIUM CYANIDE	5.00E-02 <sup>a</sup>	5.00E-02 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
000152-16-9	OCTAMETHYLPYROPHOSPHORAMIDE	2.00E-03 <sup>b</sup>	2.00E-03 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
000158-59-2	DICHLOROETHYLENE, 1,2-C-	1.00E-02 <sup>b</sup>	1.00E-01 <sup>b</sup>	NA	NA	NA	NA	NA	NA	D <sup>a</sup>
000158-60-5	DICHLOROETHYLENE, 1,2-T-	2.00E-02 <sup>a</sup>	2.00E-01 <sup>b</sup>	NA	NA	NA	NA	NA	NA	D <sup>a</sup>
000191-24-2	BENZO[G,H,I]PERYLENE	NA	NA	NA	NA	NA	NA	NA	NA	D <sup>a</sup>
000193-39-5	INDENO[1,2,3-cd]PYRENE	NA	NA	NA	NA	NA	NA	NA	NA	B2 <sup>a</sup>
000205-89-2	BENZO[BJ]FLUORANTHENE	NA	NA <sup>a</sup>	NA	NA	NA	NA	NA	NA	B2 <sup>a</sup>
000206-44-0	FLUORANTHENE	4.00E-02 <sup>a</sup>	4.00E-01 <sup>b</sup>	NA	NA	NA	NA	NA	NA	D <sup>a</sup>
000207-08-9	BENZO[K]FLUORANTHENE	NA	NA	NA	NA	NA	NA	NA	NA	B2 <sup>b</sup>
000218-01-9	CHRYSENE	NA	NA	NA	NA	NA	NA	NA	NA	B2 <sup>a</sup>
000298-00-0	METHYL PARATHION	2.50E-04 <sup>a</sup>	2.00E-03 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
000298-02-2	PHORATE	2.00E-04 <sup>b</sup>	2.00E-04 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
000298-04-4	DISULFOTON	4.00E-05 <sup>a</sup>	4.00E-05 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
000299-84-3	RONNEL	5.00E-02 <sup>b</sup>	5.00E-02 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
000300-76-5	NALED	2.00E-03 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
000302-01-2	HYDRAZINE	NA	NA	3.00E+00 <sup>a</sup>	8.50E-05 <sup>a</sup>	NA	NA	1.70E+01 <sup>b</sup>	4.90E-03 <sup>a</sup>	B2 <sup>a</sup>

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		Chronic	Subchronic			Chronic	Subchronic			
000304-61-0	ANTIMONY POTASSIUM TARTRATE	9.00E-04 <sup>b</sup>	9.00E-04 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA <sup>a</sup>
000309-00-2	ALDRIN	3.00E-05 <sup>a</sup>	3.00E-05 <sup>b</sup>	1.70E+01 <sup>a</sup>	4.90E-04 <sup>a</sup>	NA	NA	1.70E+01 <sup>b</sup>	4.90E-03 <sup>a</sup>	B2 <sup>a</sup>
000311-45-5	DIETHYL-P-NITROPHENYLPHOSPHATE	NA	NA	NA	NA	NA	NA	NA	NA	D
000319-84-6	HEXACHLOROCYCLOHEXANE, ALPHA-	NA	NA	6.30E+00 <sup>a</sup>	1.80E-04 <sup>a</sup>	NA	NA	6.30E+00 <sup>b</sup>	1.80E-03 <sup>a</sup>	B2 <sup>a</sup>
000319-85-7	HEXACHLOROCYCLOHEXANE, BETA-	NA	NA	1.80E+00 <sup>a</sup>	5.30E-05 <sup>a</sup>	NA	NA	1.80E+00 <sup>b</sup>	5.30E-04 <sup>a</sup>	C <sup>a</sup>
000319-88-8	HEXACHLOROCYCLOHEXANE, DELTA-	NA	NA	NA	NA	NA	NA	NA	NA	D <sup>a</sup>
000330-54-1	DIURON	2.00E-03 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	D
000330-55-2	LINURON	2.00E-03 <sup>a</sup>	2.00E-03 <sup>b</sup>	NA	NA	NA	NA	NA	NA	C <sup>a</sup>
000333-41-5	DIAZINON	9.00E-04 <sup>b</sup>	9.00E-04 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
000460-18-5	CYANOGEN	4.00E-02 <sup>a</sup>	4.00E-02 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
000479-45-8	TRINITROPHENYL METHYL NITRAMINE	1.00E-02 <sup>b</sup>	1.00E-01 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA <sup>a</sup>
000504-24-5	AMINOPYRIDINE, 4-	2.00E-05 <sup>a</sup>	2.00E-04 <sup>b</sup>	NA	NA	NA	NA	NA	NA	D
000506-61-6	POTASSIUM SILVER CYANIDE	2.00E-01 <sup>a</sup>	2.00E-01 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
000506-64-9	SILVER CYANIDE	1.00E-01 <sup>a</sup>	1.00E-01 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
000506-68-3	CYANOGEN BROMIDE	9.00E-02 <sup>a</sup>	9.00E-02 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
000506-77-4	CYANOGEN CHLORIDE	5.00E-02 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA <sup>a</sup>
000507-20-0	BUTYLCHLORIDE, T-	NA	NA	NA	NA	NA	NA	NA	NA	D <sup>b</sup>
000510-15-6	CHLOROBENZILATE	2.00E-02 <sup>a</sup>	2.00E-02 <sup>b</sup>	2.70E-01 <sup>b</sup>	7.80E-06 <sup>b</sup>	NA	NA	2.70E-01 <sup>b</sup>	7.80E-05 <sup>b</sup>	B2 <sup>b</sup>
000512-58-1	TRIMETHYL PHOSPHATE	NA	NA	3.70E-02 <sup>b</sup>	1.10E-06 <sup>b</sup>	NA	NA	NA	NA	B2 <sup>a</sup>
000528-29-0	DINITROBENZENE, 1,2-	4.00E-04 <sup>b</sup>	4.00E-03 <sup>b</sup>	NA	NA	NA	NA	NA	NA	D <sup>b</sup>
000531-82-8	FURIUM	NA	NA	5.00E+01 <sup>b</sup>	1.40E-03 <sup>b</sup>	NA	NA	NA	NA	B2
000532-27-4	CHLOROACETOPHENONE, 2-	NA	NA	NA	NA	3.00E-05 <sup>a</sup>	NA	NA	NA	NA
000540-59-0	DICHLOROETHYLENE, 1,2-, (MIXED ISOMERS)	9.00E-03 <sup>b</sup>	9.00E-03 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA <sup>b</sup>
000540-73-8	DIMETHYLHYDRAZINE, 1,2-	NA	NA	NA <sup>e</sup>	NA <sup>e</sup>	NA	NA	NA <sup>b</sup>	NA <sup>e</sup>	B2 <sup>b</sup>
000541-73-1	DICHLOROBENZENE, 1,3-	NA	NA	NA	NA	NA	NA	NA	NA	D

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CAS Number	Chemical	Oral RfD (mg/kg/day)		Oral Slope Factor (mg/kg/day) <sup>-1</sup>	Oral Unit Risk (µg/L) <sup>-1</sup>	Inhalation RfC (mg/m <sup>3</sup> )		Inhalation Slope Factor (mg/kg/day) <sup>-1</sup>	Inhalation Unit Risk (µg/m <sup>3</sup> ) <sup>-1</sup>	EPA Class
		Chronic	Subchronic			Chronic	Subchronic			
000542-62-1	BARIUM CYANIDE	1.00E-01 <sup>b</sup>	1.00E-01 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
000542-75-6	DICHLOROPROPENE, 1,3-	3.00E-04 <sup>a</sup>	3.00E-03 <sup>b</sup>	1.80E-01 <sup>b</sup>	5.00E-06 <sup>b</sup>	2.00E-02 <sup>a</sup>	2.00E-02 <sup>b</sup>	1.30E-01 <sup>b</sup>	3.70E-05 <sup>b</sup>	B2 <sup>a</sup>
000542-88-1	BIS(CHLOROMETHYL)ETHER	NA	NA	2.20E+02 <sup>a</sup>	6.20E-03 <sup>a</sup>	NA	NA	2.20E+02 <sup>b</sup>	6.20E-02 <sup>a</sup>	A <sup>a</sup>
000542-92-7	CYCLOPENTADIENE	NA	NA	NA	NA	NA	3.00E+00 <sup>b,c</sup>	NA	NA	NA
000544-92-3	COPPER CYANIDE	5.00E-03 <sup>a</sup>	5.00E-02 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
000558-88-7	NITROGUANIDINE	1.00E-01 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	D <sup>a</sup>
000557-21-1	ZINC CYANIDE	5.00E-02 <sup>a</sup>	5.00E-02 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
000563-12-2	ETHION	5.00E-04 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
000563-68-8	THALLIUM ACETATE	9.00E-05 <sup>a</sup>	9.00E-04 <sup>b</sup>	NA	NA	NA	NA	NA	NA	D <sup>a</sup>
000576-26-1	DIMETHYLPHENOL, 2,6-	6.00E-04 <sup>a</sup>	6.00E-03 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
000581-27-5	AMINOPHENOL, m-	7.00E-02 <sup>b</sup>	7.00E-01 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
000592-01-5	CALCIUM CYANIDE	4.00E-02 <sup>a</sup>	4.00E-02 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
000593-60-2	VINYL BROMIDE	NA	NA	NA	NA	3.00E-03 <sup>a</sup>	3.00E-03 <sup>b</sup>	1.10E-01 <sup>b</sup>	3.20E-05 <sup>b</sup>	B2 <sup>b</sup>
000594-15-0	TRIBROMOCHLOROMETHANE	NA	NA	NA	NA	NA	NA	NA	NA	D <sup>a</sup>
000594-18-3	DIBROMODICHLOROMETHANE	NA	NA	NA	NA	NA	NA	NA	NA	D <sup>a</sup>
000598-77-6	TRICHLOROPROPANE, 1,1,2-	5.00E-03 <sup>a</sup>	5.00E-02 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
000606-20-2	DINITROTOLUENE, 2,6-	1.00E-03 <sup>b</sup>	1.00E-02 <sup>b</sup>	6.80E-01 <sup>a,g</sup>	1.80E-05 <sup>a</sup>	NA	NA	NA	NA	B2 <sup>a</sup>
000608-73-1	HEXACHLOROCYCLOHEXANE, TECHNICAL	NA	NA	1.80E+00 <sup>a</sup>	5.10E-05 <sup>a</sup>	NA	NA	1.80E+00 <sup>b</sup>	5.10E-04 <sup>a</sup>	B2 <sup>a</sup>
000608-93-5	PENTACHLOROBENZENE	8.00E-04 <sup>a</sup>	8.00E-03 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
000615-54-3	TRIBROMOBENZENE, 1,2,4-	5.00E-03 <sup>a</sup>	5.00E-02 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
000616-23-9	DICHLOROPROPANOL, 2,3-	3.00E-03 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
000617-84-5	DIETHYLFORMAMIDE	1.10E-02 <sup>b</sup>	1.10E-02 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
000621-64-7	NITROSO-DI-N-PROPYLAMINE, N-	NA	NA	7.00E+00 <sup>a</sup>	2.00E-04 <sup>a</sup>	NA	NA	NA	NA	B2 <sup>a</sup>
000630-10-4	SELENOUREA	5.00E-03 <sup>b</sup>	5.00E-03 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
000630-20-6	TETRACHLOROETHANE, 1,1,1,2-	3.00E-02 <sup>a</sup>	3.00E-02 <sup>b</sup>	2.60E-02 <sup>a</sup>	7.40E-07 <sup>a</sup>	NA	NA	2.60E-02 <sup>b</sup>	7.40E-06 <sup>a</sup>	C <sup>a</sup>

**SUMMARY OF REFERENCE DOSES (RfD), REFERENCE CONCENTRATIONS (RfC), SLOPE FACTORS ( $q_1^*$ ),  
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CAS Number	Chemical	Oral RfD (mg/kg/day)		Oral Slope Factor (mg/kg/day) <sup>-1</sup>	Oral Unit Risk (µg/L) <sup>-1</sup>	Inhalation RfC (mg/m <sup>3</sup> )		Inhalation Slope Factor (mg/kg/day) <sup>-1</sup>	Inhalation Unit Risk (µg/m <sup>3</sup> ) <sup>-1</sup>	EPA Class
		Chronic	Subchronic			Chronic	Subchronic			
000634-93-5	TRICHLOROANILINE, 2,4,6-	NA	NA	3.40E-02 <sup>b</sup>	1.00E-06 <sup>b</sup>	NA	NA	NA	NA	C <sup>b</sup>
000636-21-5	METHYLANILINE HYDROCHLORIDE, 2-	NA	NA	1.80E-01 <sup>b</sup>	5.10E-06 <sup>b</sup>	NA	NA	NA	NA	B2 <sup>b</sup>
000684-93-5	NITROSO-N-METHYLUREA, N-	NA	NA	NA	NA	NA	NA	NA	NA	B2 <sup>b</sup>
000693-21-0	DIETHYLENE GLYCOL DINITRATE (DEGON)	NA	NA	NA	NA	NA	NA	NA	NA	D <sup>a</sup>
000709-98-8	PROPANIL	5.00E-03 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
000732-11-6	PHOSMET	2.00E-02 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
000759-73-9	NITROSO-N-ETHYLUREA, N-	NA	NA	1.40E+02 <sup>b</sup>	NA	NA	NA	NA	NA	B2 <sup>b</sup>
000759-84-4	EPTC	2.50E-02 <sup>a</sup>	2.50E-02 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA <sup>b</sup>
000764-41-0	DICHLORO-2-BUTENE, 1,4-	NA	NA	NA	NA	NA	NA	8.30E+00 <sup>b</sup>	2.60E-03 <sup>b</sup>	B2 <sup>b</sup>
000765-34-4	GLYCIDYL	4.00E-04 <sup>a</sup>	4.00E-03 <sup>b</sup>	NA	NA	1.00E-03 <sup>b</sup>	1.00E-02 <sup>b</sup>	NA	NA	B2 <sup>a</sup>
000822-06-0	HEXAMETHYLENE DIISOCYANATE, 1,6-	NA	NA	NA	NA	1.00E-05 <sup>a</sup>	NA	NA	NA	NA
000823-40-5	TOLUENE-2,6-DIAMINE	2.00E-01 <sup>b</sup>	2.00E-01 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
000834-12-8	AMETRYN	9.00E-03 <sup>a</sup>	9.00E-02 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
000886-50-0	TERBUTRYN	1.00E-03 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
000924-18-3	NITROSO-DI-N-BUTYLAMINE, N-	NA	NA	5.40E+00 <sup>a</sup>	1.80E-04 <sup>a</sup>	NA	NA	5.40E+00 <sup>b</sup>	1.80E-03 <sup>a</sup>	B2 <sup>a</sup>
000930-55-2	NITROSPYRROLIDINE, N-	NA	NA	2.10E+00 <sup>a</sup>	6.10E-05 <sup>a</sup>	NA	NA	2.10E+00 <sup>b</sup>	6.10E-04 <sup>a</sup>	B2 <sup>a</sup>
000934-73-6	CHLOROPHENYL METHYL SULFOXIDE	NA	NA	NA	NA	NA	NA	NA	NA	D <sup>a</sup>
000944-22-9	FONOPOS	2.00E-03 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	D <sup>a</sup>
000950-10-7	MEPHOSFOLAN	9.00E-05 <sup>b</sup>	9.00E-04 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
000950-37-8	METHIDATHION	1.00E-03 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	C <sup>a</sup>
000957-51-7	DIPHENAMID	3.00E-02 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	D <sup>a</sup>
000961-11-5	STIROFOS (TETRACHLOROVINPHOS)	3.00E-02 <sup>a</sup>	3.00E-02 <sup>b</sup>	2.40E-02 <sup>b</sup>	6.90E-07 <sup>b</sup>	NA	NA	NA	NA	C <sup>b</sup>
001024-57-3	HEPTACHLOR EPOXIDE	1.30E-05 <sup>a</sup>	1.30E-05 <sup>b</sup>	9.10E+00 <sup>a</sup>	2.60E-04 <sup>a</sup>	NA	NA	9.10E+00 <sup>b</sup>	2.60E-03 <sup>a</sup>	B2 <sup>a</sup>
001071-83-6	GLYPHOSATE	1.00E-01 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	D <sup>a</sup>
001114-71-2	PEBULATE	5.00E-02 <sup>b</sup>	5.00E-02 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA

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CAS Number	Chemical	Oral RfD (mg/kg/day)		Oral Slope Factor (mg/kg/day) <sup>-1</sup>	Oral Unit Risk (µg/L) <sup>-1</sup>	Inhalation RfC (mg/m <sup>3</sup> )		Inhalation Slope Factor (mg/kg/day) <sup>-1</sup>	Inhalation Unit Risk (µg/m <sup>3</sup> ) <sup>-1</sup>	EPA Class
		Chronic	Subchronic			Chronic	Subchronic			
001116-54-7	NITROSODIETHANOLAMINE, N-	NA	NA	2.80E+00 <sup>a</sup>	8.00E-05 <sup>a</sup>	NA	NA	NA	NA	B2 <sup>a</sup>
001163-19-5	DECABROMODIPHENYL ETHER	1.00E-02 <sup>a</sup>	1.00E-02 <sup>b</sup>	NA	NA	NA	NA	NA	NA	C <sup>a</sup>
001309-84-4	ANTIMONY TRIOXIDE	4.00E-04 <sup>b</sup>	4.00E-04 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
001314-32-5	THALLIC OXIDE	7.00E-05 <sup>b</sup>	7.00E-04 <sup>b</sup>	NA	NA	NA	NA	NA	NA	D <sup>b</sup>
001314-60-9	ANTIMONY PENTOXIDE	5.00E-04 <sup>b</sup>	5.00E-04 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
001314-82-1	VANADIUM PENTOXIDE	9.00E-03 <sup>b</sup>	9.00E-03 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
001314-84-7	ZINC PHOSPHIDE	3.00E-04 <sup>a</sup>	3.00E-03 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
001330-20-7	XYLENE, MIXTURE	2.00E+00 <sup>a</sup>	NA <sup>e</sup>	NA	NA	NA	NA	NA	NA	D <sup>a</sup>
001332-21-4	ASBESTOS	NA	NA	NA	NA	NA	NA	NA	2.30E-01 <sup>a,h</sup>	A <sup>a</sup>
001332-81-6	ANTIMONY TETOXIDE	4.00E-04 <sup>b</sup>	4.00E-04 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
001336-96-3	POLYCHLORINATED BIPHENYLS	NA	NA	7.70E+00 <sup>e</sup>	2.20E-04 <sup>a</sup>	NA	NA	NA	NA	B2 <sup>a</sup>
001445-75-8	DIISOPROPYL METHYLPHOSPHONATE	8.00E-02 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	D <sup>b</sup>
001563-88-2	CARBOFURAN	5.00E-03 <sup>a</sup>	5.00E-03 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
001569-02-4	PROPYLENE GLYCOL MONOETHYL ETHER	7.00E-01 <sup>b</sup>	7.00E+00 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
001582-09-8	TRIFLURALIN	7.50E-03 <sup>a</sup>	7.50E-03 <sup>b</sup>	7.70E-03 <sup>a</sup>	2.20E-07 <sup>a</sup>	NA	NA	NA	NA	C <sup>a</sup>
001596-84-5	ALAR	1.50E-01 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
001610-18-0	PROMETON	1.50E-02 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	D <sup>b</sup>
001634-04-4	METHYL TERT-BUTYL ETHER (MTBE)	NA	NA	NA	NA	3.00E+00 <sup>a</sup>	NA	NA	NA	NA
001646-88-4	ALDICARB SULFONE	1.00E-03 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
001689-84-5	BROMOXYNIL	2.00E-02 <sup>a</sup>	2.00E-02 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
001689-98-2	BROMOXYNIL OCTANOATE	2.00E-02 <sup>a</sup>	2.00E-02 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
001746-01-6	TCDD, 2,3,7,8-	NA	NA	1.50E+05 <sup>b</sup>	4.50E+00 <sup>b</sup>	NA	NA	1.50E+05 <sup>b</sup>	3.30E-05 <sup>b,l</sup>	B2 <sup>b</sup>
001752-26-1	TRIMETHYLETHYL LEAD	NA <sup>d</sup>	NA	NA	NA	NA	NA	NA	NA	NA
001762-28-3	METHYLTRIETHYL LEAD	NA <sup>d</sup>	NA	NA	NA	NA	NA	NA	NA	NA
001832-54-8	ISOPROPYL METHYL PHOSPHONIC ACID	1.00E-01 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	D <sup>a</sup>

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		Chronic	Subchronic			Chronic	Subchronic			
001861-32-1	DACTHAL	1.00E-02 <sup>a</sup>	5.00E-01 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
001861-40-1	BENEFIN	3.00E-01 <sup>a</sup>	3.00E-01 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
001897-45-6	CHLOROTHALONIL	1.50E-02 <sup>a</sup>	1.50E-02 <sup>b</sup>	1.10E-02 <sup>b</sup>	3.10E-07 <sup>b</sup>	NA	NA	NA	NA	B2 <sup>b</sup>
001910-42-5	PARAQUAT	4.50E-03 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	C <sup>a</sup>
001912-24-9	ATRAZINE	3.50E-02 <sup>a</sup>	3.50E-02 <sup>b</sup>	2.22E-01 <sup>b</sup>	8.30E-06 <sup>b</sup>	NA	NA	NA	NA	C <sup>b</sup>
001918-00-9	DICAMBA	3.00E-02 <sup>a</sup>	3.00E-02 <sup>b</sup>	NA	NA	NA	NA	NA	NA	D <sup>a</sup>
001918-02-1	PICLORAM	7.00E-02 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	D <sup>a</sup>
001918-16-7	PROPACHLOR	1.30E-02 <sup>a</sup>	1.30E-01 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
001920-90-7	TETRABUTYL LEAD	NA <sup>d</sup>	NA	NA	NA	NA	NA	NA	NA	NA
001929-77-7	VERNOLATE	1.00E-03 <sup>a</sup>	1.00E-02 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
001929-82-4	NITRAPYRIN	NA	NA	NA	NA	NA	NA	NA	NA	NA
001937-37-7	DIRECT BLACK 38	NA	NA	8.60E+00 <sup>b</sup>	2.40E-04 <sup>b</sup>	NA	NA	NA	NA	A <sup>b</sup>
002008-41-6	BUTYLATE	5.00E-02 <sup>a</sup>	5.00E-02 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
002014-83-7	TRICHLOROTOLUENE, ALPHA 2,6-	NA	5.00E-05 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
002050-47-7	DIBROMODIPHENYL ETHER, p,p'	NA	NA	NA	NA	NA	NA	NA	NA	D <sup>b</sup>
002077-46-5	TRICHLOROTOLUENE, 2,3,6-	NA	5.00E-05 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
002104-64-5	ETHYL-p-NITROPHENYL PHOSPHONATE	1.00E-05 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
002104-96-3	BROMOPHOS	5.00E-03 <sup>b</sup>	5.00E-02 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
002164-17-2	FLUOMETURON	1.30E-02 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	D <sup>a</sup>
002212-67-1	MOLINATE	2.00E-03 <sup>a</sup>	2.00E-03 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
002303-16-4	DIALLATE	NA	NA	6.10E-02 <sup>b</sup>	1.70E-06 <sup>b</sup>	NA	NA	NA	NA	B2 <sup>b</sup>
002303-17-5	TRIALLATE	1.30E-02 <sup>a</sup>	1.30E-02 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
002312-35-8	PROPARGITE	2.00E-02 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
002385-85-5	MIREX	2.00E-04 <sup>a</sup>	2.00E-04 <sup>b</sup>	NA	NA	NA	NA	NA	NA	B2 <sup>b</sup>
002425-06-1	CAPTAFOL	2.00E-03 <sup>a</sup>	2.00E-03 <sup>b</sup>	8.60E-03 <sup>b</sup>	2.40E-07 <sup>b</sup>	NA	NA	NA	NA	C <sup>b</sup>

**SUMMARY OF REFERENCE DOSES (RfD), REFERENCE CONCENTRATIONS (RfC), SLOPE FACTORS ( $a_1^*$ ),  
UNIT RISKS, AND EPA CANCER CLASSIFICATION FROM IRIS AND HEAST IN CAS NUMBER ORDER**

CAS Number	Chemical	Oral RfD (mg/kg/day)		Oral Slope Factor (mg/kg/day) <sup>-1</sup>	Oral Unit Risk ( $\mu\text{g/L}$ ) <sup>-1</sup>	Inhalation RfC (mg/m <sup>3</sup> )		Inhalation Slope Factor (mg/kg/day) <sup>-1</sup>	Inhalation Unit Risk ( $\mu\text{g/m}^3$ ) <sup>-1</sup>	EPA Class
		Chronic	Subchronic			Chronic	Subchronic			
002429-74-5	NIAGARA BLUE 4B	NA	NA	NA	NA	NA	NA	NA	NA	b
002439-10-3	DODINE	4.00E-03 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
002602-46-2	DIRECT BLUE 6	NA	NA	8.10E+00 <sup>b</sup>	2.30E-04 <sup>b</sup>	NA	NA	NA	NA	A <sup>b</sup>
002610-05-1	DIRECT SKY BLUE	NA	NA	NA	NA	NA	NA	NA	NA	B2
002691-41-0	OCTAHYDRO-1,3,5,7-TETRANITRO-1,3,5,7-TETRA (HMX)	5.00E-02 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	D <sup>a</sup>
002921-88-2	CHLORPYRIFOS	3.00E-03 <sup>a</sup>	3.00E-03 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
003165-93-3	CHLORO-2-METHYLANILINE HCL, 4-	NA	NA	4.60E-01 <sup>b</sup>	1.30E-05 <sup>b</sup>	NA	NA	NA	NA	B2 <sup>b</sup>
003337-71-1	ASULAM	5.00E-02 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
003380-34-5	TRICHLORO-2'-HYDROXYDIPHENYLETHER	NA	4.00E+00 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
003383-98-8	TEMEPHOS	2.00E-02 <sup>b</sup>	2.00E-01 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
003440-75-3	TETRAPROPYL LEAD	NA <sup>d</sup>	NA	NA	NA	NA	NA	NA	NA	NA
003689-24-5	TETRAETHYL DITHIOPYROPHOSPHATE	5.00E-04 <sup>a</sup>	5.00E-03 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
004549-40-0	NITROSOMETHYLVINYLMINE, N-	NA	NA	NA	NA	NA	NA	NA	NA	B2 <sup>b</sup>
005218-25-1	TETRACHLOROTOLUENE, p- ALPHA, ALPHA, ALPHA-	NA	NA	2.00E+01 <sup>b</sup>	5.70E-04 <sup>b</sup>	NA	NA	NA	NA	B2 <sup>b</sup>
005224-23-7	TRIETHYL LEAD	NA <sup>d</sup>	NA	NA	NA	NA	NA	NA	NA	NA
005234-68-4	CARBOXIN	1.00E-01 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
005598-13-0	CHLORPYRIFOS METHYL	1.00E-02 <sup>b</sup>	1.00E-02 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
005902-51-2	TERBACIL	1.30E-02 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
006108-10-7	HEXACHLOROCYCLOHEXANE, EPSILON	NA	NA	NA	NA	NA	NA	NA	NA	D <sup>a</sup>
006533-73-9	THALLIUM CARBONATE	8.00E-05 <sup>a</sup>	8.00E-04 <sup>b</sup>	NA	NA	NA	NA	NA	NA	D <sup>a</sup>
006618-03-7	TRIPROPYL LEAD	NA <sup>d</sup>	NA	NA	NA	NA	NA	NA	NA	NA
007287-19-6	PROMETRYN	4.00E-03 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
007439-92-1	LEAD AND COMPOUNDS	NA	NA	NA	NA	NA	NA	NA	NA	B2 <sup>a</sup>
007439-98-6	MANGANESE (Diet)	1.40E-01 <sup>a</sup>	1.40E-01 <sup>b</sup>	NA	NA	5.00E-05 <sup>a</sup>	NA	NA	NA	D <sup>a</sup>
007439-96-5	MANGANESE (Water)	5.00E-03 <sup>a</sup>	5.00E-03 <sup>b</sup>	NA	NA	5.00E-05 <sup>a</sup>	NA	NA	NA	D <sup>a</sup>

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UNIT RISKS, AND EPA CANCER CLASSIFICATION FROM IRIS AND HEAST IN CAS NUMBER ORDER**

CAS Number	Chemical	Oral RfD (mg/kg/day)		Oral Slope Factor (mg/kg/day) <sup>-1</sup>	Oral Unit Risk (µg/L) <sup>-1</sup>	Inhalation RfC (mg/m <sup>3</sup> )		Inhalation Slope Factor (mg/kg/day) <sup>-1</sup>	Inhalation Unit Risk (µg/m <sup>3</sup> ) <sup>-1</sup>	EPA Class
		Chronic	Subchronic			Chronic	Subchronic			
007439-97-8	MERCURY, INORGANIC	3.00E-04 <sup>b</sup>	3.00E-04 <sup>b</sup>	NA	NA	3.00E-04 <sup>b</sup>	3.00E-04 <sup>b</sup>	NA	NA	D <sup>a</sup>
007439-98-7	MOLYBDENUM	5.00E-03 <sup>a</sup>	5.00E-03 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
007440-02-0	NICKEL SOLUBLE SALTS	2.00E-02 <sup>a</sup>	2.00E-02 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
007440-22-4	SILVER	5.00E-03 <sup>a</sup>	5.00E-03 <sup>b</sup>	NA	NA	NA	NA	NA	NA	D <sup>a</sup>
007440-24-6	STRONTIUM, STABLE	6.00E-01 <sup>a</sup>	6.00E-01 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
007440-31-5	TIN	6.00E-01 <sup>b</sup>	6.00E-01 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
007440-36-0	ANTIMONY (METALLIC)	4.00E-04 <sup>a</sup>	4.00E-04 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
007440-38-2	ARSENIC, INORGANIC	3.00E-04 <sup>a</sup>	3.00E-04 <sup>b</sup>	NA	5.00E-05 <sup>a</sup>	NA	NA	5.00E+01 <sup>b</sup>	4.30E-03 <sup>a</sup>	A <sup>a</sup>
007440-39-3	BARIUM	7.00E-02 <sup>a</sup>	7.00E-02 <sup>b</sup>	NA	NA	5.00E-04 <sup>b,c</sup>	5.00E-03 <sup>b,c</sup>	NA	NA	NA
007440-41-7	BERYLLIUM	5.00E-03 <sup>a</sup>	5.00E-03 <sup>b</sup>	4.30E+00 <sup>a</sup>	1.20E-04 <sup>a</sup>	NA	NA	8.40E+00 <sup>b</sup>	2.40E-03 <sup>a</sup>	B2 <sup>a</sup>
007440-42-8	BORON and BORATES ONLY	9.00E-02 <sup>a</sup>	9.00E-02 <sup>b</sup>	NA	NA	2.00E-02 <sup>b</sup>	2.00E-02 <sup>b</sup>	NA	NA	NA
007440-43-9	CADMIUM (Diet)	1.00E-03 <sup>a</sup>	NA	NA	NA	NA	NA	8.10E+00 <sup>b</sup>	1.80E-03 <sup>a</sup>	B1 <sup>a</sup>
007440-43-8	CADMIUM (Water)	5.00E-04 <sup>a</sup>	NA	NA	NA	NA	NA	8.10E+00 <sup>b</sup>	1.80E-03 <sup>a</sup>	B1 <sup>a</sup>
007440-50-6	COPPER	NA	NA <sup>f</sup>	NA	NA	NA	NA <sup>f</sup>	NA	NA	D
007440-62-2	VANADIUM, METALLIC	7.00E-03 <sup>b</sup>	7.00E-03 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
007440-66-6	ZINC (METALLIC)	3.00E-01 <sup>a</sup>	3.00E-01 <sup>b</sup>	NA	NA	NA	NA	NA	NA	D <sup>a</sup>
007442-13-9	TRIMETHYL LEAD	NA <sup>d</sup>	NA	NA	NA	NA	NA	NA	NA	NA
007446-18-6	THALLIUM SULFATE	8.00E-05 <sup>a</sup>	8.00E-04 <sup>b</sup>	NA	NA	NA	NA	NA	NA	D <sup>a</sup>
007446-34-6	SELENIUM SULFIDE	NA	NA	NA	NA	NA	NA	NA	NA	B2 <sup>a</sup>
007637-07-2	BORON TRIFLUORIDE	NA	NA	NA	NA	7.00E-04 <sup>b</sup>	7.00E-03 <sup>b</sup>	NA	NA	NA
007647-01-0	HYDROGEN CHLORIDE	NA	NA	NA	NA	7.00E-03 <sup>a</sup>	NA	NA	NA	NA
007664-41-7	AMMONIA	NA	NA	NA	NA	1.00E-01 <sup>a</sup>	1.00E-01 <sup>b</sup>	NA	NA	NA
007723-14-0	WHITE PHOSPHORUS	2.00E-05 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	D <sup>a</sup>
007773-06-0	AMMONIUM SULFAMATE	2.00E-01 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
007782-41-4	FLUORIDE	6.00E-02 <sup>a</sup>	6.00E-02 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA

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CAS Number	Chemical	Oral RfD (mg/kg/day)		Oral Slope Factor (mg/kg/day) <sup>-1</sup>	Oral Unit Risk (µg/L) <sup>-1</sup>	Inhalation RfC (mg/m <sup>3</sup> )		Inhalation Slope Factor (mg/kg/day) <sup>-1</sup>	Inhalation Unit Risk (µg/m <sup>3</sup> ) <sup>-1</sup>	EPA Class
		Chronic	Subchronic			Chronic	Subchronic			
007782-49-2	SELENIUM	5.00E-03 <sup>a</sup>	5.00E-03 <sup>b</sup>	NA	NA	NA	NA	NA	NA	D <sup>a</sup>
007782-50-5	CHLORINE	1.00E-01 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
007783-00-8	SELENIOUS ACID	5.00E-03 <sup>a</sup>	5.00E-03 <sup>b</sup>	NA	NA	NA	NA	NA	NA	D <sup>a</sup>
007783-06-4	HYDROGEN SULFIDE	3.00E-03 <sup>a</sup>	3.00E-02 <sup>b</sup>	NA	NA	9.00E-04 <sup>a</sup>	9.00E-03 <sup>b</sup>	NA	NA	NA
007784-42-1	ARSINE	NA	NA	NA	NA	5.00E-05 <sup>a</sup>	NA	NA	NA	NA
007791-12-0	THALLIUM CHLORIDE	8.00E-05 <sup>a</sup>	8.00E-04 <sup>b</sup>	NA	NA	NA	NA	NA	NA	D <sup>a</sup>
007803-51-2	PHOSPHINE	3.00E-04 <sup>a</sup>	3.00E-04 <sup>b</sup>	NA	NA	3.00E-05 <sup>b</sup>	3.00E-04 <sup>b</sup>	NA	NA	D <sup>a</sup>
008001-35-2	TOXAPHENE	NA	NA	1.10E+00 <sup>a</sup>	3.20E-05 <sup>a</sup>	NA	NA	1.10E+00 <sup>b</sup>	3.20E-04 <sup>a</sup>	B2 <sup>a</sup>
008001-58-9	CREOSOTE	NA	NA	NA	NA	NA	NA	NA	NA	B1 <sup>a</sup>
008007-45-2	COKE OVEN EMISSIONS	NA	NA	NA	NA	NA	NA	2.20E+00 <sup>b</sup>	6.20E-04 <sup>a</sup>	A <sup>a</sup>
008018-01-7	MANCOZEB	3.00E-02 <sup>b</sup>	3.00E-02 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
008065-48-3	DEMETON	4.00E-05 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
010034-93-2	HYDRAZINE SULFATE	NA	NA	3.00E+00 <sup>a</sup>	8.50E-05 <sup>a</sup>	NA	NA	1.70E+01 <sup>b</sup>	4.90E-03 <sup>a</sup>	B2 <sup>a</sup>
010049-04-4	CHLORINE DIOXIDE	NA	NA	NA	NA	2.00E-04 <sup>a</sup>	NA	NA	NA	NA
010102-43-9	NITRIC OXIDE	NA	NA	NA	NA	NA	NA	NA	NA	NA
010102-44-0	NITROGEN DIOXIDE	NA	1.00E+00 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
010102-45-1	THALLIUM (I) NITRATE	9.00E-05 <sup>a</sup>	9.00E-04 <sup>b</sup>	NA	NA	NA	NA	NA	NA	D <sup>a</sup>
010265-92-6	METHAMIDOPHOS	5.00E-05 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
010453-86-8	RESMETHRIN	3.00E-02 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
010595-95-6	NITROSOMETHYLETHYLAMINE, N-	NA	NA	2.20E+01 <sup>a</sup>	6.30E-04 <sup>a</sup>	NA	NA	NA	NA	B2 <sup>a</sup>
010599-90-3	MONOCHLORAMINE	1.00E-01 <sup>a</sup>	1.00E-01 <sup>b</sup>	NA	NA	NA	NA	NA	NA	D <sup>a</sup>
011097-69-1	AROCLOR 1254	2.00E-05 <sup>a</sup>	5.00E-05 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
012035-72-2	NICKEL SUBSULFIDE	NA	NA	NA	NA	NA	NA	1.70E+00 <sup>b</sup>	4.80E-04 <sup>a</sup>	A <sup>a</sup>
012039-52-0	THALLIUM SELENITE	NA	NA	NA	NA	NA	NA	NA	NA	D <sup>a</sup>
012122-67-7	ZINEB	5.00E-02 <sup>a</sup>	5.00E-02 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA

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		Chronic	Subchronic			Chronic	Subchronic			
012427-38-2	MANEB	5.00E-03 <sup>a</sup>	5.00E-02 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
012674-11-2	AROCLOR 1016	7.00E-05 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
013071-79-9	TERBUFOS	2.50E-05 <sup>b</sup>	2.50E-05 <sup>b</sup>	NA	NA	NA	NA	NA	NA	D <sup>a</sup>
013463-39-3	NICKEL CARBONYL	NA	NA	NA	NA	NA	NA	NA	NA	B2 <sup>a</sup>
013593-03-8	QUINALPHOS	5.00E-04 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
013684-63-4	PHENMEDIPHAM	2.50E-01 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
013718-26-8	SODIUM METAVANADATE	1.00E-03 <sup>b</sup>	1.00E-02 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
014797-55-8	NITRATE	1.60E+00 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
014797-65-0	NITRITE	1.00E-01 <sup>a</sup>	1.00E-01 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
015299-99-7	NAPROPAMIDE	1.00E-01 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
015972-60-8	ALACHLOR	1.00E-02 <sup>a</sup>	1.00E-02 <sup>b</sup>	8.00E-02 <sup>b</sup>	2.30E-06 <sup>b</sup>	NA	NA	NA	NA	B2 <sup>a</sup>
016065-83-1	CHROMIUM (II) (INSOLUBLE SALTS)	1.00E+00 <sup>a</sup>	1.00E+00 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA <sup>b</sup>
016071-86-8	DIRECT BROWN 95	NA	NA	9.30E+00 <sup>b</sup>	2.60E-04 <sup>b</sup>	NA	NA	NA	NA	A
016672-87-0	ETHEPHON	5.00E-03 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
016752-77-5	METHOMYL	2.50E-02 <sup>a</sup>	2.50E-02 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
017804-35-2	BENOMYL	5.00E-02 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
018540-29-9	CHROMIUM (VI)	5.00E-03 <sup>a</sup>	2.00E-02 <sup>b,e</sup>	NA	NA	NA	NA	4.10E+01 <sup>b</sup>	1.20E-02 <sup>a</sup>	A <sup>a</sup>
019044-88-3	ORYZALIN	5.00E-02 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	C <sup>a</sup>
019408-74-3	HEXAChLORoBiENzo-p-DIOXIN, MIXTURE	NA	NA	6.20E+03 <sup>a</sup>	1.80E-01 <sup>a</sup>	NA	NA	NA	1.30E+00 <sup>b</sup>	B2 <sup>a</sup>
019666-30-9	OXADIAZON	5.00E-03 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
020859-73-8	ALUMINUM PHOSPHIDE	4.00E-04 <sup>a</sup>	4.00E-04 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
021087-64-9	METRIBUZIN	2.50E-02 <sup>a</sup>	2.50E-02 <sup>b</sup>	NA	NA	NA	NA	NA	NA	D <sup>a</sup>
021436-96-4	DIMETHYLANILINE HCl, 2,4-	NA	NA	5.80E-01 <sup>b</sup>	1.70E-05 <sup>b</sup>	NA	NA	NA	NA	C <sup>b</sup>
021564-17-0	TOMTB	3.00E-02 <sup>b</sup>	3.00E-01 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
021725-46-2	CYANAZINE	2.00E-03 <sup>b</sup>	2.00E-03 <sup>b</sup>	8.40E-01 <sup>b</sup>	2.40E-05 <sup>b</sup>	NA	NA	NA	NA	C <sup>b</sup>

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		Chronic	Subchronic			Chronic	Subchronic			
022224-92-6	FENAMIPHOS	2.50E-04 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA	D <sup>b</sup>
022967-92-6	METHYL MERCURY	3.00E-04 <sup>a</sup>	3.00E-04 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
023135-22-0	OXAMYL	2.50E-02 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA	NA
023564-05-8	THIOPHANATE-METHYL	8.00E-02 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
023950-58-5	KERB	7.50E-02 <sup>a</sup>	7.50E-02 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
024307-26-4	MEPIQUAT CHLORIDE	3.00E-02 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
025013-15-4	METHYL STYRENE (MIXED ISOMERS)	6.00E-03 <sup>b,c</sup>	6.00E-03 <sup>b,c</sup>	NA	NA	4.00E-02 <sup>b,c</sup>	4.00E-02 <sup>b,c</sup>	NA	NA	NA
025057-89-0	BENTAZON	2.50E-03 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
025154-42-1	MONOCHLOROBUTANES	4.00E-01 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA	NA
025329-35-5	PENTACHLOROCYCLOPENTADIENE	NA	NA	NA	NA	NA	NA	NA	NA	D <sup>a</sup>
026399-38-0	PROFLURALIN	6.00E-03 <sup>b</sup>	6.00E-03 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
026628-22-8	SODIUM AZIDE	4.00E-03 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
027314-13-2	NORFLURAZON	4.00E-02 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
027774-13-6	VANADYL SULFATE	2.00E-02 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA	NA
028249-77-6	THIOBENCARB	1.00E-02 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
029232-93-7	PIRIMIPHOS-METHYL	1.00E-02 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
030560-19-1	ACEPHATE	4.00E-03 <sup>a</sup>	4.00E-03 <sup>b</sup>	8.70E-03 <sup>a</sup>	2.50E-07 <sup>a</sup>	NA	NA	NA	NA	C <sup>a</sup>
032534-81-9	PENTABROMODIPHENYL ETHER	2.00E-03 <sup>a</sup>	2.00E-02 <sup>b</sup>	NA	NA	NA	NA	NA	NA	D <sup>a</sup>
032536-52-0	OCTABROMODIPHENYL ETHER	3.00E-03 <sup>a</sup>	3.00E-02 <sup>b</sup>	NA	NA	NA	NA	NA	NA	D <sup>a</sup>
033089-61-1	AMITRAZ	2.50E-03 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
033663-50-2	TRICHLOROANILINE HCL, 2,4,6-	NA	NA	2.90E-02 <sup>b</sup>	8.20E-07 <sup>b</sup>	NA	NA	NA	NA	C <sup>b</sup>
033820-53-0	ISOPROPALIN	1.50E-02 <sup>a</sup>	1.50E-01 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
034014-18-1	TEBUTHIURON	7.00E-02 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	D <sup>a</sup>
034256-82-1	ACETOCHLOR	2.00E-02 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
035367-38-5	DIFLUBENZURON	2.00E-02 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA

**SUMMARY OF REFERENCE DOSES (RfD), REFERENCE CONCENTRATIONS (RfC), SLOPE FACTORS ( $a_1^*$ ),  
UNIT RISKS, AND EPA CANCER CLASSIFICATION FROM IRIS AND HEAST IN CAS NUMBER ORDER**

CAS Number	Chemical	Oral RfD (mg/kg/day)		Oral Slope Factor (mg/kg/day) <sup>-1</sup>	Oral Unit Risk (µg/L) <sup>-1</sup>	Inhalation RfC (mg/m <sup>3</sup> )		Inhalation Slope Factor (mg/kg/day) <sup>-1</sup>	Inhalation Unit Risk (µg/m <sup>3</sup> ) <sup>-1</sup>	EPA Class
		Chronic	Subchronic			Chronic	Subchronic			
035554-44-0	IMAZALIL	1.30E-02 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
036734-19-7	IPRODIONE	4.00E-02 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
036907-42-3	VANADIUM SULFATE	2.00E-02 <sup>b</sup>	2.00E-02 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
039148-24-8	FOSETYL-AL	3.00E+00 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	C <sup>b</sup>
039196-18-4	THIOFANOX	3.00E-04 <sup>b</sup>	3.00E-04 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
039515-41-8	FENPROPATHRIN	2.50E-02 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
039638-32-8	BIS(2-CHLOROISOPROPYL)ETHER	4.00E-02 <sup>a</sup>	4.00E-02 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
040487-42-1	PENDIMETHALIN	4.00E-02 <sup>a</sup>	4.00E-02 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
041851-50-7	CHLOROCYCLOPENTADIENE	NA	NA	NA	NA	NA	NA	NA	NA	D <sup>a</sup>
042874-03-3	GOAL	3.00E-03 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
043121-43-3	BAYLETON	3.00E-02 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
043222-48-8	DIFENZOQUAT	8.00E-02 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
049690-94-0	TRIBROMODIPHENYL ETHER	NA	NA	NA	NA	NA	NA	NA	NA	D <sup>b</sup>
050471-44-8	VINCLOZOLIN	2.50E-02 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
051218-45-2	METOLACHLOR	1.50E-01 <sup>a</sup>	1.50E-01 <sup>b</sup>	NA	NA	NA	NA	NA	NA	C <sup>a</sup>
051235-04-2	HEXAZINONE	3.30E-02 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	D <sup>a</sup>
051630-58-1	PYDRIN	2.50E-02 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
052315-07-8	CYPERMETHRIN	1.00E-02 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
052645-53-1	PERMETHRIN	5.00E-02 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
055285-14-8	CARBOSULFAN	1.00E-02 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
055290-64-7	DIMETHIPIN	2.00E-02 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	C <sup>a</sup>
056425-91-3	FLURPRIMIDOL	2.00E-02 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
057837-19-1	METALAXYL	6.00E-02 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
058138-08-2	TRIDIPHANE	3.00E-03 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
059756-60-4	FLURIDONE	8.00E-02 <sup>a</sup>	8.00E-02 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA

**SUMMARY OF REFERENCE DOSES (RfD), REFERENCE CONCENTRATIONS (RfC), SLOPE FACTORS ( $q_1^*$ ),  
UNIT RISKS, AND EPA CANCER CLASSIFICATION FROM IRIS AND HEAST IN CAS NUMBER ORDER**

CAS Number	Chemical	Oral RfD (mg/kg/day)		Oral Slope Factor (mg/kg/day) <sup>-1</sup>	Oral Unit Risk (µg/L) <sup>-1</sup>	Inhalation RfC (mg/m <sup>3</sup> )		Inhalation Slope Factor (mg/kg/day) <sup>-1</sup>	Inhalation Unit Risk (µg/m <sup>3</sup> ) <sup>-1</sup>	EPA Class
		Chronic	Subchronic			Chronic	Subchronic			
060207-90-1	PROPICONAZOLE	1.30E-02 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
060238-58-4	CHLORTHIOPHOS	8.00E-04 <sup>b</sup>	8.00E-04 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA
060568-05-0	FURMECYCLOX	NA	NA	3.00E-02 <sup>a</sup>	8.60E-07 <sup>a</sup>	NA	NA	NA	NA	B2 <sup>b</sup>
062476-59-9	SODIUM ACIFLUORFEN	1.30E-02 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
064902-72-3	CHLORSULFURON	5.00E-02 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
065195-55-3	AVERMECTIN B1	4.00E-04 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA	NA
066215-27-8	CYROMAZINE	7.50E-03 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
066332-96-5	FLUTOLANIL	6.00E-02 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
066841-25-6	TRALOMETHRIN	7.50E-03 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
067485-29-4	AMDRO	3.00E-04 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
067747-09-5	PROCHLORAZ	9.00E-03 <sup>a</sup>	NA	1.50E-01 <sup>a</sup>	4.30E-06 <sup>b</sup>	NA	NA	NA	NA	C <sup>b</sup>
068085-85-8	CYHALOTHRIN/KARATE	5.00E-03 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
068359-37-5	BAYTHROID	2.50E-02 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
069409-94-5	FLUVALINATE	1.00E-02 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
069808-40-2	HALOXYFOP-METHYL	5.00E-05 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA	NA
072178-02-0	FOMESAFEN	NA	NA	1.90E-01 <sup>a</sup>	5.40E-06 <sup>b</sup>	NA	NA	NA	NA	C <sup>b</sup>
073506-94-2	CHLORODIBROMOETHANE	NA	NA	8.40E-02 <sup>b</sup>	NA	NA	NA	NA	NA	NA
074051-80-2	SETHOXYDIM	8.00E-02 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
074115-24-5	APOLLO	1.30E-02 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	C <sup>b</sup>
074223-84-6	ALLY	2.50E-01 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
076578-14-8	ASSURE	9.00E-03 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	D <sup>b</sup>
076738-62-0	PACLOBUTRAZOL	1.30E-02 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
077182-82-2	GLUFOSINATE-AMMONIUM	4.00E-04 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA	NA
077501-63-4	LACTOFEN	2.00E-03 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
078587-05-0	SAVEY	2.50E-02 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA

**SUMMARY OF REFERENCE DOSES (RfD), REFERENCE CONCENTRATIONS (RFC), SLOPE FACTORS ( $q_1^*$ ),  
UNIT RISKS, AND EPA CANCER CLASSIFICATION FROM IRIS AND HEAST IN CAS NUMBER ORDER**

CAS Number	Chemical	Oral RfD (mg/kg/day)		Oral Slope Factor (mg/kg/day) <sup>-1</sup>	Oral Unit Risk (µg/L) <sup>-1</sup>	Inhalation RFC (mg/m <sup>3</sup> )		Inhalation Slope Factor (mg/kg/day) <sup>-1</sup>	Inhalation Unit Risk (µg/m <sup>3</sup> ) <sup>-1</sup>	EPA Class
		Chronic	Subchronic			Chronic	Subchronic			
079277-27-3	HARMONY	1.30E-02 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
081335-37-7	IMAZAQUIN	2.50E-01 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
081335-77-5	PURSUIT	2.50E-01 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
082097-50-5	TRIASULFURON	1.00E-02 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
082558-60-7	ISOXABEN	5.00E-02 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	C <sup>b</sup>
082657-04-3	BIPHENTHRIN	1.50E-02 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
083055-99-6	LONDAX	2.00E-01 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
085509-19-9	NUSTAR	7.00E-04 <sup>b</sup>	NA	NA	NA	NA	NA	NA	NA	NA
088671-89-0	RALLY	2.50E-02 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
090982-32-4	CHLORIMURON-ETHYL	2.00E-02 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
091465-08-6	KARATE	5.00E-03 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
101200-48-0	EXPRESS	8.00E-03 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA
107584-40-7	DIMETHYLETHYL LEAD	NA <sup>d</sup>	NA	NA	NA	NA	NA	NA	NA	NA
NA	LEAD ALKYLs	NA <sup>d</sup>	NA	NA	NA	NA	NA	NA	NA	NA
NA	NICKEL REFINERY DUST	NA	NA	NA	NA	NA	NA	8.40E-01 <sup>b</sup>	2.40E-04 <sup>a</sup>	A <sup>b</sup>
NA	POLYBROMINATED BIPHENYLS	7.00E-06 <sup>b</sup>	7.00E-05 <sup>b</sup>	8.90E+00 <sup>b</sup>	2.50E-04 <sup>b</sup>	NA	NA	NA	NA	B2 <sup>b</sup>
NA	REFRACTORY CERAMIC FIBERS	NA	NA	NA	NA	NA	NA	NA	NA	B2 <sup>a</sup>
NA	THALLIUM (SOLUBLE SALTS)	NA	NA	NA	NA	NA	NA	NA	NA	NA
NA	URANIUM (SOLUBLE SALTS)	3.00E-03 <sup>a</sup>	NA	NA	NA	NA	NA	NA	NA	NA

<sup>a</sup> Source: Integrated Risk Information System (IRIS)

<sup>b</sup> Source: Health Effects Assessment Summary Table (HEAST) FY1994 and July Supplement

<sup>c</sup> This value was derived from methodology that is not current with the interim inhalation methodology used by the RfD/RFC Work Group (see HEAST Table 2 for details).

<sup>d</sup> Lead Alkyls - See IRIS cover sheet for further explanation

<sup>e</sup> Contact the Superfund Health Risk Technical Support Center: (513) 569-7300

<sup>f</sup> HEAST concluded that toxicity data were inadequate for calculation of a subchronic RfD for copper and substituted the current drinking water standard (MCLG) of 1.3 mg/L.

<sup>g</sup> Listed as "Dinitrotoluene mixture, 2,4-/2,6-" in IRIS. The value is based on a study using technical grade DNT.

<sup>h</sup> Value expressed as fibers/mL

<sup>i</sup> (pg/m<sup>3</sup>)<sup>-1</sup>



## SECTION THREE

## **RADIONUCLIDE CARCINOGENICITY FROM HEAST**

**OCTOBER 1994**

The following tables from the Health Effects Assessment Summary Tables (Annual FY 1994 -- March 1994; and Supplement No. 1 -- July 1994) summarize the cancer slope factors and pathway specific unit risk values for selected radionuclides calculated by the EPA Office of Radiation Programs. These values should be applied as specified by the radiation risk assessment guidance provided in Chapter 10 of the Risk Assessment Guidance for Superfund: Volume 1, Human Health Evaluation Manual, Part A (EPA/540/1-89/002).

EPA classifies all radionuclides as Group A carcinogens based on their property of emitting ionizing radiation and on the weight of evidence provided by epidemiological studies of radiation-induced tumors in humans.

**RADIONUCLIDE CARCINOGENICITY FROM HEAST  
SLOPE FACTORS IN PICOCURIES**

**OCTOBER 1994**

**Radionuclide Carcinogenicity From HEAST – Slope Factors<sup>a</sup>  
(In Units of Picocuries<sup>b</sup>)**

Element (Atomic Number)	Isotope <sup>c</sup>	CASRN <sup>d</sup>	Radioactive Half-Life <sup>e</sup>	ICRP Lung Class <sup>f</sup>	GI Absorption Factor ( $f_1$ ) <sup>g</sup>	Slope Factor Lifetime Excess Total Cancer Risk Per Unit Intake or Exposure		
						Ingestion (Risk/pCi)	Inhalation (Risk/pCi)	External Exposure (Risk/yr per pCi/g soil)
Actinium (89)	Ac-225 <sup>†</sup>	014265-85-1	1.000E+01 D	Y	1.0E-03	1.7E-11	2.4E-09	7.6E-09
	Ac-227 <sup>†</sup>	014952-40-0	2.180E+01 Y	Y	1.0E-03	2.8E-10	8.0E-08	2.6E-11
	Ac-227+D	014952-40-0(+D)	2.180E+01 Y	Y	1.0E-03	3.5E-10	8.8E-08	8.5E-07
	Ac-228 <sup>†</sup>	014331-83-0	6.130E+00 H	Y	1.0E-03	5.0E-13	2.6E-11	2.9E-06
Americium (95)	Am-241 <sup>†</sup>	014596-10-2	4.320E+02 Y	W	1.0E-03	2.4E-10	3.2E-08	4.9E-09
	Am-242	013981-54-9	1.600E+01 H	W	1.0E-03	3.6E-13	1.2E-11	5.8E-09
	Am-242m	013981-54-9(m)	1.520E+02 Y	W	1.0E-03	2.3E-10	2.8E-08	1.2E-10
	Am-243 <sup>†</sup>	014993-75-0	7.380E+03 Y	W	1.0E-03	2.4E-10	3.2E-08	2.4E-08
	Am-243+D	014993-75-0(+D)	7.380E+03 Y	W	1.0E-03	2.4E-10	3.2E-08	2.5E-07
Antimony (51)	Sb-122	014374-79-9	2.700E+00 D	W	1.0E-01	2.0E-12	3.4E-12	1.4E-06
	Sb-124	014683-10-4	6.020E+01 D	W	1.0E-01	2.9E-12	2.2E-11	6.5E-06
	Sb-125	014234-35-6	2.770E+00 Y	W	1.0E-01	8.4E-13	1.1E-11	1.2E-06
	Sb-126	015756-32-8	1.240E+01 D	W	1.0E-01	2.8E-12	8.8E-12	9.1E-06
	Sb-126m	015756-32-8(m)	1.900E+01 M	W	1.0E-01	7.2E-14	2.6E-14	5.1E-06
	Sb-127	013968-50-8	3.850E+00 D	W	1.0E-01	2.0E-12	4.1E-12	2.1E-06

**Radionuclide Carcinogenicity From HEAST – Slope Factors<sup>a</sup>  
(In Units of Picocuries<sup>b</sup>)**

Element (Atomic Number)	Isotope <sup>c</sup>	CASRN <sup>d</sup>	Radioactive Half-Life <sup>e</sup>	ICRP Lung Class <sup>f</sup>	GI Absorption Factor (f <sub>g</sub> ) <sup>g</sup>	Slope Factor Lifetime Excess Total Cancer Risk Per Unit Intake or Exposure		
						Ingestion (Risk/pCi)	Inhalation (Risk/pCi)	External Exposure (Risk/yr per pCi/g soft)
	Sb-129	014331-88-5	4.400E+00 H	W	1.0E-01	5.9E-13	5.1E-13	4.9E-06
Argon (18)	Ar-41	014163-25-8	1.830E+00 H	•	1.0E+00	—	5.8E-16	4.4E-06
Astatine (85)	At-217 <sup>†</sup>	017239-90-6	3.230E-02 S	D	1.0E+00	4.5E-18	5.6E-17	7.7E-10
Barium (56)	Ba-131	014914-75-1	1.180E+01 D	D	1.0E-01	4.8E-13	3.6E-13	1.2E-06
	Ba-133	013981-41-4	1.050E+01 Y	D	1.0E-01	1.2E-12	3.6E-12	8.4E-07
	Ba-133m	013981-41-4(m)	3.890E+01 H	D	1.0E-01	6.2E-13	3.5E-13	9.5E-06
	Ba-137m <sup>†</sup>	013981-97-0(m)	2.550E+00 M	D	1.0E-01	2.4E-15	6.0E-16	2.0E-06
	Ba-139	014378-25-7	8.310E+01 M	D	1.0E-01	2.1E-13	1.5E-13	7.7E-08
	Ba-140	014790-08-4	1.280E+01 D	D	1.0E-01	2.7E-12	2.0E-12	5.4E-07
Beryllium (4)	Be-7	013966-02-4	5.340E+01 D	Y	5.0E-03	3.0E-14	2.7E-13	1.5E-07
Bismuth (83)	Bi-206	015776-19-9	6.240E+00 D	W	5.0E-02	2.2E-12	4.3E-12	1.1E-05
	Bi-207	013982-38-2	3.340E+01 Y	W	5.0E-02	1.4E-12	1.8E-11	4.9E-06
	Bi-210 <sup>†</sup>	014331-79-4	5.010E+00 D	W	5.0E-02	1.6E-12	8.0E-11	0.0E+00
	Bi-211 <sup>†</sup>	015229-37-5	2.130E+00 M	W	5.0E-02	1.2E-14	1.9E-13	1.3E-07
	Bi-212 <sup>†</sup>	014913-49-6	6.055E+01 M	W	5.0E-02	3.1E-13	6.6E-12	5.9E-07

**Radionuclide Carcinogenicity From HEAST – Slope Factors<sup>a</sup>  
(In Units of Picocuries<sup>b</sup>)**

Element (Atomic Number)	Isotope <sup>c</sup>	CASRN <sup>d</sup>	Radioactive Half-life <sup>e</sup>	ICRP Lung Class <sup>f</sup>	GI Absorption Factor ( $f_1$ ) <sup>g</sup>	Slope Factor Lifetime Excess Total Cancer Risk Per Unit Intake or Exposure		
						Ingestion (Risk/pCi)	Inhalation (Risk/pCi)	External Exposure (Risk/yr per pCi/g soil)
Bromine (35)	Br-213 <sup>†</sup>	015776-20-2	4.570E+01 M	W	5.0E-02	2.3E-13	3.0E-13	4.1E-07
	Br-214 <sup>†</sup>	014733-03-0	1.990E+01 M	W	5.0E-02	1.3E-13	2.1E-12	5.3E-06
Bromine (35)	Br-82	014686-69-2	3.530E+01 H	D	1.0E+00	1.1E-12	8.7E-13	8.9E-06
Cadmium (20)	Cd-109	014109-32-1	4.640E+02 D	Y	5.0E-02	7.9E-12	6.5E-11	7.3E-10
	Cd-115	014336-68-6	5.350E+01 H	Y	5.0E-02	1.7E-12	2.6E-12	6.3E-07
	Cd-115m	014336-68-6(m)	4.460E+01 D	Y	5.0E-02	5.2E-12	3.9E-11	7.5E-08
Calcium (20)	Ca-45	013988-05-7	1.630E+02 D	W	3.0E-01	9.9E-13	5.1E-12	5.8E-18
	Ca-47	001439-99-2	4.540E+00 D	W	3.0E-01	2.0E-12	4.6E-12	3.8E-06
Carbon (6)	C-11	014333-33-6	2.050E+01 M	D	1.0E+00	4.9E-14	2.1E-14	3.2E-06
	C-14	014762-75-5	5.730E+03 Y	•	1.0E+00	9.0E-13	6.4E-15	0.0E+00
	C-15	015929-23-4	2.450E+00 S	D	1.0E+00	8.1E-16	2.1E-16	—
Cerium (58)	Ce-141	013967-74-3	3.250E+01 D	Y	3.0E-04	8.3E-13	8.4E-12	1.3E-07
	Ce-143	014119-19-6	3.300E+01 H	Y	3.0E-04	1.3E-12	2.2E-12	6.7E-07
	Ce-144	014762-78-8	2.840E+02 D	Y	3.0E-04	6.1E-12	3.4E-10	2.5E-06
Cesium (55)	Cs-131	014914-76-2	9.690E+00 D	D	1.0E+00	1.4E-13	1.0E-13	2.8E-09

**Radionuclide Carcinogenicity From HEAST – Slope Factors<sup>a</sup>  
(In Units of Picocuries<sup>b</sup>)**

Element (Atomic Number)	Isotope <sup>c</sup>	CASPIN <sup>d</sup>	Radioactive Half-life <sup>e</sup>	ICRP Lung Class <sup>f</sup>	GI Absorption Factor ( $\beta_1$ ) <sup>g</sup>	Slope Factor Lifetime Excess Total Cancer Risk Per Unit Intake or Exposure		
						Ingestion (Risk/pCi)	Inhalation (Risk/pCi)	External Exposure (Risk/yr per pCi/g soft)
Cesium (37)	Ce-134	013967-70-9	2.060E+00 Y	D	1.0E+00	4.1E-11	2.8E-11	5.2E-06
	Ce-134m	013967-70-9(m)	2.900E+00 H	D	1.0E+00	4.1E-14	3.9E-14	2.0E-08
	Ce-135	015726-30-4	2.300E+06 Y	D	1.0E+00	4.0E-12	2.7E-12	0.0E+00
	Ce-136	014234-29-8	1.320E+01 D	D	1.0E+00	6.7E-12	4.6E-12	7.2E-06
	Ce-137 <sup>†</sup>	010045-97-3	3.020E+01 Y	D	1.0E+00	2.8E-11	1.9E-11	0.0E+00
	Ce-137+D	010045-97-3(+D)	3.020E+01 Y	D	1.0E+00	2.8E-11	1.9E-11	2.0E-06
	Ce-138	015758-29-9	3.220E+01 M	D	1.0E+00	1.9E-13	9.6E-14	8.3E-06
Chlorine (17)	Cl-36	013981-43-6	3.010E+05 Y	D	1.0E+00	1.8E-12	1.4E-12	0.0E+00
	Cl-38	014158-34-0	3.720E+01 M	D	1.0E+00	2.3E-13	1.3E-13	5.7E-06
Chromium (24)	Cr-51	014392-02-0	2.770E+01 D	Y	1.0E-01	4.3E-14	3.0E-13	9.2E-06
Cobalt (27)	Co-57	013981-50-5	2.710E+02 D	Y	3.0E-01	5.8E-13	8.2E-12	1.8E-07
	Co-58	013981-38-9	7.080E+01 D	Y	3.0E-01	1.6E-12	9.8E-12	3.3E-06
	Co-58m	013981-38-9(m)	9.150E+00 H	Y	3.0E-01	3.2E-14	7.3E-14	4.8E-11
	Co-60	010198-40-0	5.270E+00 Y	Y	3.0E-01	1.5E-11	1.5E-10	8.6E-06
Copper (29)	Cu-64	013981-25-4	1.270E+01 H	Y	5.0E-01	1.7E-13	2.0E-13	6.0E-07

**Radionuclide Carcinogenicity From HEAST – Slope Factors<sup>a</sup>  
(In Units of Picocuries<sup>b</sup>)**

Element (Atomic Number)	Isotope <sup>c</sup>	CASRN <sup>d</sup>	Radioactive Half-life <sup>e</sup>	ICRP Lung Class <sup>f</sup>	GI Absorption Factor ( $F_1$ ) <sup>g</sup>	Slope Factor Lifetime Excess Total Cancer Risk Per Unit Intake or Exposure		
						Ingestion (Risk/pCi)	Inhalation (Risk/pCi)	External Exposure (Risk/yr per pCi/g soil)
Curium (96)	Cm-242	015510-73-3	1.630E+02 D	W	1.0E-03	1.3E-11	3.9E-09	3.4E-11
	Cm-243	015757-87-6	2.850E+01 Y	W	1.0E-03	1.9E-10	2.6E-08	1.6E-07
	Cm-244	013981-15-2	1.810E+01 Y	W	1.0E-03	1.6E-10	2.2E-08	3.0E-11
	Cm-245	015621-76-8	8.500E+03 Y	W	1.0E-03	2.4E-10	3.2E-08	5.3E-08
	Cm-246	015757-90-1	4.750E+03 Y	W	1.0E-03	2.4E-10	3.2E-08	2.7E-11
	Cm-247	015758-32-4	1.560E+07 Y	W	1.0E-03	2.2E-10	3.0E-08	9.2E-07
	Cm-248	015758-33-5	3.390E+05 Y	W	1.0E-03	9.1E-10	1.2E-07	2.2E-11
Dysprosium (66)	Dy-165	013967-84-1	2.330E+00 H	W	3.0E-04	1.5E-13	1.1E-13	5.7E-08
	Dy-168	015840-01-4	8.160E+01 H	W	3.0E-04	1.9E-12	5.0E-12	2.7E-08
Erblum (63)	Er-169	015840-13-8	9.400E+00 D	W	3.0E-04	4.4E-13	1.5E-12	8.4E-12
	Er-171	014391-45-8	7.520E+00 H	W	3.0E-04	4.6E-13	3.9E-13	9.4E-07
Europium (63)	Eu-152	014683-23-9	1.360E+01 Y	W	1.0E-03	2.1E-12	1.1E-10	3.6E-06
	Eu-154	015585-10-1	8.800E+00 Y	W	1.0E-03	3.0E-12	1.4E-10	4.1E-06
	Eu-155	014391-16-3	4.960E+00 Y	W	1.0E-03	4.5E-13	1.8E-11	5.9E-08
	Eu-156	014280-35-4	1.520E+01 D	W	1.0E-03	2.5E-12	1.1E-11	4.8E-06

**Radionuclide Carcinogenicity From HEAST – Slope Factors<sup>a</sup>  
(In Units of Picocuries<sup>b</sup>)**

Element (Atomic Number)	Isotope <sup>c</sup>	CASRN <sup>d</sup>	Radioactive Half-life <sup>e</sup>	ICRP Lung Class <sup>f</sup>	GI Absorption Factor ( $F_1$ ) <sup>g</sup>	Slope Factor Lifetime Excess Total Cancer Risk Per Unit Intake or Exposure		
						Ingestion (Risk/pCi)	Inhalation (Risk/pCi)	External Exposure (Risk/yr per pCi/g soil)
Fluorine (9)	F-18	013981-56-1	1.100E+02 M	D	1.0E+00	9.8E-14	7.1E-14	3.1E-06
Francium (87)	Fr-221 <sup>†</sup>	015756-41-9	4.800E+00 M	D	1.0E+00	5.9E-14	9.2E-13	8.2E-06
	Fr-223 <sup>†</sup>	015756-98-6	2.180E+00 M	D	1.0E+00	1.7E-13	4.2E-13	4.1E-06
Gadolinium (64)	Gd-153	014276-65-4	2.420E+02 D	W	3.0E-04	3.1E-13	5.8E-12	7.3E-06
	Gd-159	014041-42-0	1.860E+01 H	W	3.0E-04	5.9E-13	6.3E-13	8.9E-06
Gallium (31)	Ga-67	014119-09-6	3.260E+00 D	W	1.0E-03	2.1E-13	3.6E-13	3.3E-07
	Ga-72	013962-22-4	1.410E+01 H	W	1.0E-03	1.3E-12	1.2E-12	9.8E-06
Germanium (32)	Ge-71	014374-81-3	1.180E+01 D	W	1.0E+00	6.8E-15	1.3E-13	2.3E-11
Gold (79)	Au-196	014914-16-0	6.180E+00 D	Y	1.0E-01	3.9E-13	8.7E-13	1.3E-06
	Au-198	010043-49-0	2.700E+00 D	Y	1.0E-01	1.2E-12	2.1E-12	1.2E-06
Holmium (67)	Ho-166	013967-65-2	2.680E+01 H	W	3.0E-04	1.7E-12	2.2E-12	6.5E-06
Hydrogen (1)	H-3	010028-17-8	1.230E+01 Y	*	1.0E+00	5.4E-14	7.8E-14	0.0E+00
Indium (49)	In-113m	014885-78-0(m)	1.660E+00 H	W	2.0E-02	4.9E-14	2.9E-14	7.0E-07
	In-114	013981-55-0	7.190E+01 S	W	2.0E-02	5.5E-15	1.5E-15	1.0E-07
	In-114m	013981-55-0(m)	4.950E+01 D	W	2.0E-02	5.4E-12	4.2E-11	1.8E-07

**Radionuclide Carcinogenicity From HEAST – Slope Factors<sup>a</sup>  
(In Units of Picocuries<sup>b</sup>)**

Element (Atomic Number)	Isotope <sup>c</sup>	CASRN <sup>d</sup>	Radioactive Half-life <sup>e</sup>	ICRP Lung Class <sup>f</sup>	GI Absorption Factor ( $f_1$ ) <sup>g</sup>	Slope Factor Lifetime Excess Total Cancer Risk Per Unit Intake or Exposure		
						Ingestion (Risk/pCi)	Inhalation (Risk/pCi)	External Exposure (Risk/yr per pCi/g soil)
Iodine (53)	In-115	014191-71-0	4.600E+15 Y	W	2.0E-02	3.2E-11	2.2E-10	0.0E+00
	In-115m	014191-71-0(m)	4.360E+00 H	W	2.0E-02	1.2E-13	9.4E-14	3.9E-07
	I-122	018287-75-7	3.620E+00 M	D	1.0E+00	2.5E-14	7.9E-15	3.0E-06
	I-123	015715-08-9	1.310E+01 H	D	1.0E+00	1.0E-12	5.7E-13	2.4E-07
	I-125	014158-31-7	6.010E+01 D	D	1.0E+00	7.9E-12	5.3E-12	2.9E-09
	I-126	014158-32-8	1.290E+01 D	D	1.0E+00	1.5E-11	9.8E-12	1.3E-08
	I-129	015046-84-1	1.570E+07 Y	D	1.0E+00	1.9E-10	1.2E-10	4.1E-09
	I-130	014914-02-4	1.240E+01 H	D	1.0E+00	9.1E-12	5.1E-12	7.0E-06
	I-131	010043-66-0	8.040E+00 D	D	1.0E+00	3.6E-11	2.4E-11	1.5E-06
	I-132	014683-16-0	2.300E+00 H	D	1.0E+00	1.0E-12	5.8E-13	7.7E-06
	I-133	014834-67-4	2.080E+01 H	D	1.0E+00	2.1E-11	1.2E-11	2.0E-06
Iridium (77)	I-134	014914-27-3	5.260E+01 M	D	1.0E+00	2.8E-13	1.6E-13	9.0E-06
	I-135	014834-68-5	6.610E+00 H	D	1.0E+00	4.2E-12	2.4E-12	5.5E-06
Iridium (77)	Ir-190	014981-91-0	1.180E+01 D	Y	1.0E-02	1.4E-12	4.8E-12	4.2E-06
	Ir-192	014694-69-0	7.400E+01 D	Y	1.0E-02	1.7E-12	2.7E-11	2.4E-06

**Radionuclide Carcinogenicity From HEAST – Slope Factors<sup>a</sup>  
(In Units of Picocuries<sup>b</sup>)**

Element (Atomic Number)	Isotope <sup>c</sup>	CASRN <sup>d</sup>	Radioactive Half-life <sup>e</sup>	ICRP Lung Class <sup>f</sup>	GI Absorption Factor ( $f_1$ ) <sup>g</sup>	Slope Factor Lifetime Excess Total Cancer Risk Per Unit Intake or Exposure		
						Ingestion (Risk/pCi)	Inhalation (Risk/pCi)	External Exposure (Risk/yr per pCi/g soil)
Iron (26)	Ir-194	014158-35-1	1.920E+01 H	Y	1.0E-02	1.6E-12	1.8E-12	2.8E-07
	Fe-55	014681-59-5	2.700E+00 Y	W	1.0E-01	2.7E-13	8.4E-13	0.0E+00
	Fe-59	014596-12-4	4.480E+01 D	W	1.0E-01	2.8E-12	9.7E-12	4.1E-06
Krypton (36)	Kr-83m	013965-98-5(m)	1.830E+00 H	*	1.0E+00	—	6.2E-17	3.4E-11
	Kr-85	013983-27-2	1.070E+01 Y	*	1.0E+00	—	4.7E-17	7.0E-09
	Kr-85m	013983-27-2(m)	4.480E+00 H	*	1.0E+00	—	4.9E-16	3.4E-07
	Kr-87	014809-68-8	7.630E+01 M	*	1.0E+00	—	2.2E-15	2.8E-06
	Kr-88	014895-81-0	2.840E+00 H	*	1.0E+00	—	4.7E-15	7.3E-06
	Kr-89	016316-03-3	3.160E+00 M	*	1.0E+00	—	2.0E-15	6.5E-06
	Kr-90	015741-13-6	3.230E+01 S	*	1.0E+00	—	2.4E-15	4.2E-06
	La-140	013981-28-7	4.020E+01 H	W	1.0E-03	2.3E-12	3.0E-12	8.0E-06
	Lead (82)	Pb-203	5.200E+01 H	D	2.0E-01	3.2E-13	2.6E-13	5.9E-07
		Pb-209 <sup>t</sup>	3.250E+00 H	D	2.0E-01	8.5E-14	7.0E-14	0.0E+00
		Pb-210 <sup>t</sup>	2.230E+01 Y	D	2.0E-01	5.1E-10	1.3E-09	1.3E-10
	Pb-210+D	014255-04-0(+D)	2.230E+01 Y	D	2.0E-01	6.6E-10	4.0E-09	1.6E-10

**Radionuclide Carcinogenicity From HEAST – Slope Factors<sup>a</sup>  
(In Units of Picocuries<sup>b</sup>)**

Element (Atomic Number)	Isotope <sup>c</sup>	CASRN <sup>d</sup>	Radioactive Half-Life <sup>e</sup>	ICRP Lung Class <sup>f</sup>	GI Absorption Factor ( $f_g$ ) <sup>g</sup>	Slope Factor Lifetime Excess Total Cancer Risk Per Unit Intake or Exposure		
						Ingestion (Risk/pCi)	Inhalation (Risk/pCi)	External Exposure (Risk/yr per pCi/g soil)
Lead (82)	Pb-211 <sup>†</sup>	015816-77-0	3.610E+01 M	D	2.0E-01	1.8E-13	2.8E-12	1.6E-07
	Pb-212 <sup>†</sup>	015092-84-1	1.060E+01 H	D	2.0E-01	5.5E-12	4.3E-11	2.6E-07
	Pb-214 <sup>†</sup>	015067-28-4	2.680E+01 M	D	2.0E-01	1.7E-13	2.9E-12	8.4E-07
Lutetium (71)	Lu-177	014265-75-9	6.710E+00 D	Y	3.0E-04	6.2E-13	1.9E-12	8.7E-08
Manganese (25)	Mn-52	014092-99-0	5.590E+00 D	W	1.0E-01	2.2E-12	3.7E-12	1.2E-05
	Mn-54	013966-31-9	3.130E+02 D	W	1.0E-01	1.1E-12	5.3E-12	2.9E-06
	Mn-56	014681-52-8	2.580E+00 H	W	1.0E-01	4.0E-13	2.8E-13	8.1E-06
Mercury (80)	Hg-197	013981-51-6	6.410E+01 H	W	2.0E-02	2.7E-13	4.5E-13	5.5E-08
	Hg-203	013982-78-0	4.660E+01 D	W	2.0E-02	6.6E-13	4.8E-12	5.7E-07
Molybdenum (42)	Mo-99	014119-15-4	6.600E+01 H	Y	8.0E-01	1.5E-12	2.6E-12	4.9E-07
Neodymium (60)	Nd-147	014269-74-0	1.100E+01 D	Y	3.0E-04	1.3E-12	5.5E-12	3.0E-07
	Nd-149	015749-81-2	1.730E+00 H	Y	3.0E-04	1.9E-13	1.8E-13	9.8E-07
Neptunium (93)	Np-236	015700-36-4	1.150E+05 Y	W	1.0E-03	2.3E-13	3.9E-12	8.9E-08
	Np-237 <sup>†</sup>	013994-20-2	2.140E+06 Y	W	1.0E-03	2.2E-10	2.9E-08	7.8E-09
	Np-237+D	013994-20-2(+D)	2.140E+06 Y	W	1.0E-03	2.2E-10	2.9E-08	4.3E-07

**Radionuclide Carcinogenicity From HEAST – Slope Factors<sup>a</sup>  
(In Units of Picocuries<sup>b</sup>)**

Element (Atomic Number)	Isotope <sup>c</sup>	CASPIN <sup>d</sup>	Radioactive Half-life <sup>e</sup>	ICRP Lung Class <sup>f</sup>	GI Absorption Factor ( $\beta_1$ ) <sup>g</sup>	Slope Factor Lifetime Excess Total Cancer Risk Per Unit Intake or Exposure		
						Ingestion (Risk/pCi)	Inhalation (Risk/pCi)	External Exposure (Risk/yr per pCi/g soil)
Neptunium (93)	Np-238	015766-25-3	2.120E+00 D	W	1.0E-03	1.1E-12	3.3E-12	1.7E-06
	Np-239 <sup>t</sup>	013968-59-7	2.360E+00 D	W	1.0E-03	9.4E-13	1.5E-12	2.3E-07
	Np-240	015690-84-3	6.500E+01 M	W	1.0E-03	1.3E-13	6.5E-14	3.2E-06
	Np-240m	015690-84-3(m)	7.400E+00 M	W	1.0E-03	2.9E-14	9.0E-15	9.3E-07
	Nickel (28)	Ni-59	014336-70-0	7.500E+04 Y	W	5.0E-02	9.1E-14	7.0E-13
	Ni-63	013981-37-8	1.000E+02 Y	W	5.0E-02	2.4E-13	1.8E-12	0.0E+00
	Ni-65	014633-49-9	2.520E+00 H	W	5.0E-02	2.6E-13	1.9E-13	1.9E-06
	Niobium (41)	Nb-93m	007440-03-1(m)	1.460E+01 Y	Y	1.0E-02	1.5E-13	1.9E-11
Osmium (76)	Nb-94	014681-63-1	2.030E+04 Y	Y	1.0E-02	2.1E-12	2.1E-10	5.4E-06
	Nb-95	013967-76-5	3.510E+01 D	Y	1.0E-02	6.5E-13	5.1E-12	2.6E-06
	Nb-95m	013967-76-5(m)	8.660E+01 H	Y	1.0E-02	6.6E-13	1.6E-12	8.1E-08
	Nb-97	018496-04-3	7.210E+01 M	Y	1.0E-02	1.2E-13	6.9E-14	2.2E-06
	Nb-97m	018496-04-3(m)	6.000E+01 S	Y	1.0E-02	2.4E-15	1.1E-15	2.5E-06
	Oe-185	015766-50-4	9.360E+01 D	Y	1.0E-02	6.3E-13	8.9E-12	2.2E-06
	Oe-191	014119-24-5	1.540E+01 D	Y	1.0E-02	6.7E-13	3.6E-12	8.5E-08

**Radionuclide Carcinogenicity From HEAST – Slope Factors<sup>a</sup>  
(In Units of Picocuries<sup>b</sup>)**

Element (Atomic Number)	Isotope <sup>c</sup>	CASRN <sup>d</sup>	Radioactive Half-Life <sup>e</sup>	ICRP Lung Class <sup>f</sup>	GI Absorption Factor ( $F_g$ ) <sup>g</sup>	Slope Factor Lifetime Excess Total Cancer Risk Per Unit Intake or Exposure		
						Ingestion (Risk/pCi)	Inhalation (Risk/pCi)	External Exposure (Risk/yr per pCi/g soil)
	Oe-191m	014119-24-5(m)	1.300E+01 H	Y	1.0E-02	1.2E-13	2.1E-13	3.4E-09
	Oe-183	016057-77-5	3.000E+01 H	Y	1.0E-02	9.6E-13	1.2E-12	1.7E-07
Palladium (46)	Pd-100	015690-69-4	3.640E+00 D	Y	5.0E-03	1.0E-12	2.3E-12	—
	Pd-101	015749-54-9	8.480E+00 H	Y	5.0E-03	1.2E-13	1.1E-13	—
	Pd-103	014967-68-1	1.700E+01 D	Y	5.0E-03	2.2E-13	1.4E-12	7.3E-10
	Pd-107	017637-89-9	6.500E+06 Y	Y	5.0E-03	4.4E-14	6.4E-12	0.0E+00
	Pd-109	014981-64-7	1.350E+01 H	Y	5.0E-03	7.9E-13	8.1E-13	2.2E-09
	P-32	014596-37-3	1.430E+01 D	D	8.0E-01	3.5E-12	3.0E-12	0.0E+00
Phosphorus (15)	P-33	015749-66-3	2.540E+01 D	D	8.0E-01	5.6E-13	4.6E-13	0.0E+00
	Pt-191	015706-36-2	2.710E+00 D	D	1.0E-02	3.6E-13	3.0E-13	6.3E-07
	Pt-193	015735-70-3	5.000E+01 Y	D	1.0E-02	3.5E-14	8.2E-14	0.0E+00
	Pt-193m	015735-70-3(m)	4.330E+00 D	D	1.0E-02	5.3E-13	4.0E-13	7.6E-09
	Pt-197	015735-74-7	1.830E+01 H	D	1.0E-02	4.9E-13	3.2E-13	3.1E-08
	Pt-197m	015735-74-7(m)	9.440E+01 M	D	1.0E-02	1.2E-13	8.7E-14	1.6E-07
Plutonium (94)	Pu-236	015411-92-4	2.850E+00 Y	Y	1.0E-03	5.0E-11	2.4E-08	3.4E-11

**Radionuclide Carcinogenicity From HEAST – Slope Factors<sup>a</sup>  
(In Units of Picocuries<sup>b</sup>)**

Element (Atomic Number)	Isotope <sup>c</sup>	CASRN <sup>d</sup>	Radioactive Half-life <sup>e</sup>	ICRP Lung Class <sup>f</sup>	GI Absorption Factor (f <sub>i</sub> ) <sup>g</sup>	Slope Factor Lifetime Excess Total Cancer Risk Per Unit Intake or Exposure		
						Ingestion (Risk/pCi)	Inhalation (Risk/pCi)	External Exposure (Risk/yr per pCi/g soil)
Plutonium (84)	Pu-238	013981-16-3	8.780E+01 Y	Y	1.0E-03	2.2E-10	3.9E-08	2.8E-11
	Pu-239	015117-48-3	2.410E+04 Y	Y	1.0E-03	2.3E-10	3.8E-08	1.7E-11
	Pu-240	014119-33-6	6.570E+03 Y	Y	1.0E-03	2.3E-10	3.8E-08	2.7E-11
	Pu-241	014119-32-5	1.440E+01 Y	Y	1.0E-03	3.6E-12	2.3E-10	0.0E+00
	Pu-242	013982-10-0	3.760E+05 Y	Y	1.0E-03	2.2E-10	3.6E-08	2.3E-11
	Pu-243	015708-37-3	4.960E+00 H	Y	1.0E-03	1.1E-13	1.0E-13	1.8E-08
	Pu-244	014119-34-7	8.260E+07 Y	Y	1.0E-03	2.2E-10	3.6E-08	1.9E-11
	Po-210 <sup>†</sup>	013981-52-7	1.380E+02 D	W	1.0E-01	1.5E-10	2.6E-09	2.9E-11
	Po-212 <sup>†</sup>	015389-34-1	2.980E-07 S	W	1.0E-01	2.2E-23	8.1E-22	0.0E+00
	Po-213 <sup>†</sup>	015756-57-7	4.200E-06 S	W	1.0E-01	3.2E-22	8.0E-21	1.0E-10
Potassium (19)	Po-214 <sup>†</sup>	015735-67-8	1.640E-04 S	W	1.0E-01	1.0E-20	2.8E-19	2.8E-10
	Po-215 <sup>†</sup>	015706-52-2	1.780E-03 S	W	1.0E-01	2.8E-19	5.7E-18	4.6E-10
	Po-216 <sup>†</sup>	015756-58-8	1.460E-01 S	W	1.0E-01	3.0E-17	4.8E-16	5.0E-11
	Po-218 <sup>†</sup>	015422-24-9	3.050E+00 M	W	1.0E-01	2.8E-14	5.8E-13	0.0E+00
	K-40	013966-00-2	1.280E+09 Y	D	1.0E+00	1.1E-11	7.6E-12	5.4E-07

**Radionuclide Carcinogenicity From HEAST – Slope Factors<sup>a</sup>  
(In Units of Picocuries<sup>b</sup>)**

Element (Atomic Number)	Isotope <sup>c</sup>	CASRN <sup>d</sup>	Radioactive Half-life <sup>e</sup>	ICRP Lung Class <sup>f</sup>	GI Absorption Factor ( $f_g$ ) <sup>g</sup>	Slope Factor Lifetime Excess Total Cancer Risk Per Unit Intake or Exposure		
						Ingestion (Risk/pCi)	Inhalation (Risk/pCi)	External Exposure (Risk/yr per pCi/g soil)
	K-42	014378-21-3	1.240E+01 H	D	1.0E+00	8.9E-13	1.2E-12	9.6E-07
Praseodymium (59)	Pr-142	014191-64-1	1.910E+01 H	Y	3.0E-04	1.6E-12	1.6E-12	2.1E-07
	Pr-143	014981-79-4	1.360E+01 D	Y	3.0E-04	1.4E-12	7.0E-12	3.0E-14
	Pr-144	014119-05-2	1.730E+01 M	Y	3.0E-04	9.5E-14	3.6E-14	1.2E-07
	Pr-144m	014119-05-2(m)	7.200E+00 M	Y	3.0E-04	3.7E-14	1.6E-14	2.1E-09
Promethium (61)	Pm-147	014380-75-7	2.620E+00 Y	Y	3.0E-04	3.1E-13	3.0E-11	6.0E-12
	Pm-148	014683-19-3	5.370E+00 D	Y	3.0E-04	3.1E-12	7.9E-12	1.9E-06
	Pm-148m	014683-19-3(m)	4.130E+01 D	Y	3.0E-04	2.5E-12	4.8E-11	6.5E-06
	Pm-149	015765-31-8	5.310E+01 H	Y	3.0E-04	1.2E-12	1.9E-12	3.3E-08
Protactinium (91)	Pa-231 <sup>†</sup>	014331-85-2	3.730E+04 Y	Y	1.0E-03	9.2E-11	3.6E-08	2.6E-08
	Pa-233 <sup>†</sup>	013981-14-1	2.700E+01 D	Y	1.0E-03	1.0E-12	8.6E-12	4.2E-07
	Pa-234	015100-28-4	6.700E+00 H	Y	1.0E-03	6.8E-13	5.4E-13	5.9E-06
	Pa-234m <sup>†</sup>	015100-28-4(m)	1.170E+00 M	Y	1.0E-03	5.8E-15	1.6E-15	3.6E-08
Radium (88)	Ra-223 <sup>†</sup>	015623-45-7	1.140E+01 D	W	2.0E-01	6.4E-11	3.1E-09	2.3E-07
	Ra-224 <sup>†</sup>	013233-32-4	3.620E+00 D	W	2.0E-01	3.8E-11	1.2E-09	2.3E-08

**Radionuclide Carcinogenicity From HEAST – Slope Factors<sup>a</sup>  
(In Units of Picocuries<sup>b</sup>)**

Element (Atomic Number)	Isotope <sup>c</sup>	CASRN <sup>d</sup>	Radioactive Half-life <sup>e</sup>	ICRP Lung Class <sup>f</sup>	GI Absorption Factor ( $\beta$ ) <sup>g</sup>	Slope Factor Lifetime Excess Total Cancer Risk Per Unit Intake or Exposure		
						Ingestion (Risk/pCi)	Inhalation (Risk/pCi)	External Exposure (Risk/yr per pCi/g soil)
Radon (86)	Ra-225 <sup>†</sup>	013981-53-8	1.480E+01 D	W	2.0E-01	5.1E-11	1.5E-09	1.9E-09
	Ra-226 <sup>†</sup>	013982-63-3	1.600E+03 Y	W	2.0E-01	1.2E-10	3.0E-09	1.2E-08
	Ra-226+D	013982-63-3(+D)	1.600E+03 Y	W	2.0E-01	1.2E-10	3.0E-09	6.0E-06
	Ra-228 <sup>†</sup>	015262-20-1	5.750E+00 Y	W	2.0E-01	1.0E-10	6.6E-10	0.0E+00
	Ra-228+D	015262-20-1(+D)	5.750E+00 Y	W	2.0E-01	1.0E-10	6.9E-10	2.9E-06
	Rn-219 <sup>†</sup>	014835-02-0	3.960E+00 S	*	1.0E+00	—	4.6E-14	1.6E-07
	Rn-220 <sup>†</sup>	022481-48-7	5.560E+01 S	*	1.0E+00	—	1.2E-13	1.7E-09
	Rn-222 <sup>†</sup>	014859-67-7	3.820E+00 D	*	1.0E+00	1.4E-12	7.3E-13	1.2E-09
	Rn-222+D	014859-67-7(+D)	3.820E+00 D	*	1.0E+00	1.7E-12	7.7E-12	5.9E-06
	Rhodium (45)	Rh-103m	007440-18-6(m)	5.610E+01 M	Y	5.0E-02	6.9E-15	3.9E-15
Rubidium (37)	Rh-105	014913-89-4	3.540E+01 H	Y	5.0E-02	4.3E-13	5.9E-13	2.2E-07
	Rh-105m	014913-89-4(m)	4.500E+01 S	Y	5.0E-02	6.2E-16	3.4E-16	2.2E-08
	Rh-106	014234-34-5	2.990E+01 S	Y	5.0E-02	4.4E-15	1.2E-15	6.7E-07
	Rb-82	014391-63-0	1.250E+00 M	D	1.0E+00	1.2E-14	3.5E-15	3.5E-06
	Rb-86	014932-53-7	1.670E+01 D	D	1.0E+00	5.9E-12	4.5E-12	3.3E-07

**Radionuclide Carcinogenicity From HEAST – Slope Factors<sup>a</sup>  
(In Units of Picocuries<sup>b</sup>)**

Element (Atomic Number)	Isotope <sup>c</sup>	CASRN <sup>d</sup>	Radioactive Half-life <sup>e</sup>	ICRP Lung Class <sup>f</sup>	GI Absorption Factor ( $F_g$ ) <sup>g</sup>	Slope Factor Lifetime Excess Total Cancer Risk Per Unit Intake or Exposure		
						Ingestion (Risk/pCi)	Inhalation (Risk/pCi)	External Exposure (Risk/yr per pCi/g soil)
Rubidium (37)	Rb-87	013982-13-3	4.730E+10 Y	D	1.0E+00	3.4E-12	2.4E-12	0.0E+00
	Rb-88	014928-36-0	1.780E+01 M	D	1.0E+00	1.7E-13	7.9E-14	2.4E-06
	Rb-89	014191-85-2	1.540E+01 M	D	1.0E+00	9.3E-14	3.9E-14	7.4E-06
	Ru-97	015758-35-7	2.900E+00 D	Y	5.0E-02	1.7E-13	2.6E-13	4.2E-07
Ruthenium (44)	Ru-103	013968-53-1	3.940E+01 D	Y	5.0E-02	9.0E-13	8.4E-12	1.5E-06
	Ru-105	014331-95-4	4.440E+00 H	Y	5.0E-02	3.7E-13	3.3E-13	2.6E-06
	Ru-106	013967-48-1	3.680E+02 D	Y	5.0E-02	9.5E-12	4.4E-10	0.0E+00
	Sm-147	014392-33-7	1.060E+11 Y	W	3.0E-04	1.6E-11	7.2E-09	0.0E+00
Samarium (62)	Sm-151	015715-94-3	9.000E+01 Y	W	3.0E-04	1.1E-13	8.7E-12	4.0E-13
	Sm-153	015766-00-4	4.670E+01 H	W	3.0E-04	8.7E-13	1.3E-12	4.6E-08
	Sc-46	013967-63-0	8.380E+01 D	Y	1.0E-04	1.6E-12	2.7E-11	6.9E-06
Scandium (21)	Sc-47	014391-86-9	3.420E+00 D	Y	1.0E-04	6.4E-13	1.2E-12	2.3E-07
	Sc-48	014391-86-7	4.370E+01 H	Y	1.0E-04	1.9E-12	2.3E-12	1.2E-05
	Se-75	014265-71-5	1.200E+02 D	W	8.0E-01	5.8E-12	6.0E-12	8.1E-07
Silicon (14)	Si-31	014276-49-4	1.570E+02 M	W	1.0E-02	2.2E-13	1.7E-13	3.0E-09

**Radionuclide Carcinogenicity From HEAST – Slope Factors<sup>a</sup>  
(In Units of Picocuries<sup>b</sup>)**

Element (Atomic Number)	Isotope <sup>c</sup>	CASRN <sup>d</sup>	Radioactive Half-life <sup>e</sup>	ICRP Lung Class <sup>f</sup>	GI Absorption Factor (f <sub>1</sub> ) <sup>g</sup>	Slope Factor Lifetime Excess Total Cancer Risk Per Unit Intake or Exposure		
						Ingestion (Risk/pCi)	Inhalation (Risk/pCi)	External Exposure (Risk/yr per pCi/g soil)
Silver (47)	Ag-105	014928-14-4	4.130E+01 D	Y	5.0E-02	7.3E-13	4.0E-12	—
	Ag-108	014391-65-2	2.370E+00 M	Y	5.0E-02	8.5E-15	2.4E-15	5.1E-08
	Ag-108m	014391-65-2(m)	1.270E+02 Y	Y	5.0E-02	3.5E-12	1.5E-10	5.0E-06
	Ag-109m	014378-38-2(m)	3.960E+01 S	Y	5.0E-02	3.3E-16	8.9E-17	1.3E-09
	Ag-110	014391-76-5	2.460E+01 S	Y	5.0E-02	3.0E-15	8.1E-16	1.0E-07
	Ag-110m	014391-76-5(m)	2.500E+02 D	Y	5.0E-02	4.7E-12	6.9E-11	9.3E-06
	Ag-111	157690-04-0	7.460E+00 D	Y	5.0E-02	1.6E-12	4.8E-12	7.7E-08
Sodium (11)	Na-22	013986-32-0	2.600E+00 Y	D	1.0E+00	6.8E-12	4.8E-12	7.2E-06
	Na-24	013982-04-2	1.500E+01 H	D	1.0E+00	1.0E-12	9.8E-13	1.6E-05
Strontium (38)	Sr-82	014809-50-8	2.500E+01 D	D	3.0E-01	7.5E-12	6.9E-12	1.3E-10
	Sr-85	013967-73-2	6.480E+01 D	D	3.0E-01	7.7E-13	1.0E-12	1.4E-06
	Sr-85m	013967-73-2(m)	6.770E+01 M	D	3.0E-01	1.2E-14	6.1E-15	4.8E-07
	Sr-89	014158-27-1	5.060E+01 D	D	3.0E-01	3.0E-12	2.9E-12	4.7E-10
	Sr-90 <sup>†</sup>	010098-97-2	2.860E+01 Y	D	3.0E-01	3.3E-11	5.6E-11	0.0E+00
	Sr-90+D	010098-97-2(+D)	2.860E+01 Y	D	3.0E-01	3.6E-11	6.2E-11	0.0E+00

**Radionuclide Carcinogenicity From HEAST – Slope Factors<sup>a</sup>  
(In Units of Picocuries<sup>b</sup>)**

Element (Atomic Number)	Isotope <sup>c</sup>	CASRN <sup>d</sup>	Radioactive Half-life <sup>e</sup>	ICRP Lung Class <sup>f</sup>	GI Absorption Factor ( $F_g$ ) <sup>g</sup>	Slope Factor Lifetime Excess Total Cancer Risk Per Unit Intake or Exposure		
						Ingestion (Risk/pCi)	Inhalation (Risk/pCi)	External Exposure (Risk/yr per pCi/g soil)
Sodium (11)	Sr-81	014331-91-0	9.500E+00 H	D	3.0E-01	8.5E-13	6.9E-13	2.4E-06
	Sr-82	014928-29-1	2.710E+00 H	D	3.0E-01	5.7E-13	4.5E-13	4.6E-06
Sulfur (16)	S-35	015117-53-0	8.740E+01 D	D	8.0E-01	2.2E-13	1.9E-13	0.0E+00
Tantalum (73)	Ta-182	013982-00-8	1.150E+02 D	Y	1.0E-03	1.7E-12	4.3E-11	4.1E-06
Technetium (43)	Tc-95	014809-56-4	2.000E+01 H	W	8.0E-01	5.6E-14	2.3E-14	2.4E-06
	Tc-95m	014809-56-4(m)	6.100E+01 D	W	8.0E-01	1.8E-12	4.0E-12	1.9E-06
	Tc-96	014808-44-7	4.280E+00 D	W	8.0E-01	1.8E-12	2.1E-12	8.3E-06
	Tc-96m	014808-44-7(m)	5.150E+01 M	W	8.0E-01	2.3E-14	2.1E-14	7.0E-06
	Tc-97	015759-35-0	2.600E+06 Y	W	8.0E-01	1.5E-13	9.8E-13	3.5E-10
	Tc-97m	015759-35-0(m)	8.900E+01 D	W	8.0E-01	1.1E-12	5.0E-12	3.7E-10
	Tc-99	014133-76-7	2.130E+05 Y	W	8.0E-01	1.3E-12	8.3E-12	6.0E-13
	Tc-99m	014133-76-7(m)	6.020E+00 H	W	8.0E-01	5.0E-14	2.7E-14	2.3E-07
Tellurium (52)	Te-125m	014390-73-9(m)	5.800E+01 D	W	2.0E-01	8.5E-13	5.4E-12	2.6E-09
	Te-127	013981-49-2	9.350E+00 H	W	2.0E-01	2.3E-13	2.3E-13	1.4E-06
	Te-127m	013981-49-2(m)	1.090E+02 D	W	2.0E-01	2.2E-12	1.6E-11	8.4E-10

**Radionuclide Carcinogenicity From HEAST – Slope Factors<sup>a</sup>  
(In Units of Picocuries<sup>b</sup>)**

Element (Atomic Number)	Isotope <sup>c</sup>	CASRN <sup>d</sup>	Radioactive Half-life <sup>e</sup>	ICRP Lung Class <sup>f</sup>	GI Absorption Factor (f, <sub>1</sub> ) <sup>g</sup>	Slope Factor Lifetime Excess Total Cancer Risk Per Unit Intake or Exposure		
						Ingestion (Risk/pCi)	Inhalation (Risk/pCi)	External Exposure (Risk/yr per pCi/g soil)
Tellurium (52)	Te-129	014269-71-7	6.960E+01 M	W	2.0E-01	1.1E-13	6.8E-14	1.3E-07
	Te-129m	014269-71-7(m)	3.360E+01 D	W	2.0E-01	3.2E-12	2.0E-11	6.3E-08
	Te-131	014683-12-6	2.500E+01 M	W	2.0E-01	2.8E-13	1.4E-13	1.2E-06
	Te-131m	014683-12-6(m)	3.000E+01 H	W	2.0E-01	3.8E-12	5.4E-12	4.7E-06
	Te-132	014234-28-7	7.820E+01 H	W	2.0E-01	3.0E-12	5.3E-12	4.0E-07
Terbium (65)	Tb-158	015759-55-4	1.500E+02 Y	W	3.0E-04	1.2E-12	9.4E-11	—
	Tb-160	013981-29-8	7.230E+01 D	W	3.0E-04	1.8E-12	1.9E-11	3.6E-06
Thallium (81)	Tl-202	015720-57-7	1.220E+01 D	D	1.0E+00	8.4E-13	6.0E-13	1.3E-06
	Tl-204	013968-51-8	3.780E+00 Y	D	1.0E+00	1.7E-12	1.3E-12	8.7E-10
	Tl-207 <sup>†</sup>	014133-67-6	4.770E+00 M	D	1.0E+00	1.3E-14	4.5E-15	7.5E-09
	Tl-208 <sup>†</sup>	014913-50-9	3.050E+00 M	D	1.0E+00	1.8E-14	5.0E-15	1.3E-05
	Tl-209 <sup>†</sup>	015690-73-0	2.200E+00 M	D	1.0E+00	1.4E-14	4.3E-15	6.9E-06
Thorium (90)	Th-227 <sup>†</sup>	015623-47-9	1.870E+01 D	Y	2.0E-04	4.5E-12	4.9E-09	1.6E-07
	Th-228 <sup>†</sup>	014274-82-9	1.910E+00 Y	Y	2.0E-04	1.1E-11	7.7E-08	5.5E-10
	Th-228+D	014274-82-9(+D)	1.910E+00 Y	Y	2.0E-04	5.5E-11	7.8E-06	5.6E-06

**Radionuclide Carcinogenicity From HEAST – Slope Factors<sup>a</sup>  
(In Units of Picocuries<sup>b</sup>)**

Element (Atomic Number)	Isotope <sup>c</sup>	CASRN <sup>d</sup>	Radioactive Half-life <sup>e</sup>	ICRP Lung Class <sup>f</sup>	GI Absorption Factor (f <sub>i</sub> ) <sup>g</sup>	Slope Factor Lifetime Excess Total Cancer Risk Per Unit Intake or Exposure		
						Ingestion (Risk/pCi)	Inhalation (Risk/pCi)	External Exposure (Risk/yr per pCi/g soil)
Thorium (90)	Th-229 <sup>†</sup>	015594-54-4	7.340E+03 Y	Y	2.0E-04	2.1E-11	7.3E-08	5.8E-08
	Th-229+D	015594-54-4(+D)	7.340E+03 Y	Y	2.0E-04	8.9E-11	7.7E-08	6.8E-07
	Th-230 <sup>†</sup>	014269-63-7	7.700E+04 Y	Y	2.0E-04	1.3E-11	2.9E-08	5.4E-11
	Th-231 <sup>†</sup>	014932-40-2	2.550E+01 H	Y	2.0E-04	4.0E-13	4.9E-13	2.3E-09
	Th-232 <sup>†</sup>	007440-29-1	1.410E+10 Y	Y	2.0E-04	1.2E-11	2.8E-08	2.6E-11
	Th-234 <sup>†</sup>	015065-10-8	2.410E+01 D	Y	2.0E-04	4.0E-12	3.2E-11	3.5E-09
Thulium (69)	Tm-170	013961-30-1	1.290E+02 D	W	3.0E-04	1.5E-12	2.1E-11	3.8E-09
	Tm-171	014333-45-0	1.920E+00 Y	W	3.0E-04	1.2E-13	3.1E-12	3.3E-10
Tin (50)	Sn-113	013966-06-8	1.150E+02 D	W	2.0E-02	8.7E-13	9.4E-12	3.3E-09
	Sn-121	014683-06-8	2.710E+01 H	W	2.0E-02	2.7E-13	3.2E-13	—
	Sn-121m	014683-06-8(m)	5.550E+01 Y	W	2.0E-02	5.4E-13	9.3E-12	—
	Sn-125	014683-06-0	9.640E+00 D	W	2.0E-02	3.6E-12	1.2E-11	1.1E-06
	Sn-126	015832-50-5	1.000E+05 Y	W	2.0E-02	5.6E-12	7.7E-11	3.3E-08
Tungsten (74)	W-181	015749-46-9	1.210E+02 D	D	3.0E-01	8.3E-14	6.4E-14	2.2E-08
	W-185	014932-41-3	7.510E+01 D	D	3.0E-01	4.7E-13	3.0E-13	4.7E-11

**Radionuclide Carcinogenicity From HEAST – Slope Factors<sup>a</sup>  
(In Units of Picocuries<sup>b</sup>)**

Element (Atomic Number)	Isotope <sup>c</sup>	CASRN <sup>d</sup>	Radioactive Half-life <sup>e</sup>	ICRP Lung Class <sup>f</sup>	GI Absorption Factor (f <sub>1</sub> ) <sup>g</sup>	Slope Factor Lifetime Excess Total Cancer Risk Per Unit Intake or Exposure		
						Ingestion (Risk/pCi)	Inhalation (Risk/pCi)	External Exposure (Risk/yr per pCi/g soil)
Uranium (92)	W-187	014983-48-3	2.380E+01 H	D	3.0E-01	6.3E-13	3.9E-13	1.5E-06
	U-232	014158-29-3	7.200E+01 Y	Y	5.0E-02	3.7E-11	6.0E-08	4.6E-11
	U-233	013968-55-3	1.590E+05 Y	Y	5.0E-02	1.6E-11	2.7E-08	4.2E-11
	U-234 <sup>t</sup>	013968-29-5	2.450E+05 Y	Y	5.0E-02	1.6E-11	2.6E-08	3.0E-11
	U-235 <sup>t</sup>	015117-96-1	7.040E+08 Y	Y	5.0E-02	1.6E-11	2.5E-08	2.4E-07
	U-235+D	015117-96-1(+D)	7.040E+08 Y	Y	5.0E-02	1.6E-11	2.5E-08	2.4E-07
	U-236	013962-70-2	2.340E+07 Y	Y	5.0E-02	1.5E-11	2.5E-08	2.4E-11
	U-237	014269-75-1	6.750E+00 D	Y	5.0E-02	8.9E-13	2.6E-12	1.3E-07
	U-238 <sup>t</sup>	007440-61-1	4.470E+09 Y	Y	5.0E-02	1.6E-11	2.4E-08	2.1E-11
	U-238+D	007440-61-1(+D)	4.470E+09 Y	Y	5.0E-02	2.0E-11	2.4E-08	5.1E-08
Vanadium (23)	U-240	015687-53-3	1.410E+01 H	Y	5.0E-02	1.2E-12	1.2E-12	1.5E-10
	V-48	014331-87-6	1.600E+01 D	W	1.0E-02	2.2E-12	7.6E-12	9.9E-06
	Xe-122	015151-09-4	2.010E+01 H	•	1.0E+00	—	3.3E-15	8.4E-08
	Xe-123	015700-10-4	2.140E+00 H	•	1.0E+00	—	7.4E-16	1.7E-06
Xenon (54)	Xe-125	013994-18-8	1.680E+01 H	•	1.0E+00	—	4.2E-16	4.7E-07

**Radionuclide Carcinogenicity From HEAST – Slope Factors<sup>a</sup>  
(In Units of Picocuries<sup>b</sup>)**

Element (Atomic Number)	Isotope <sup>c</sup>	CASRN <sup>d</sup>	Radioactive Half-Life <sup>e</sup>	ICRP Lung Class <sup>f</sup>	GI Absorption Factor ( $F_g$ ) <sup>g</sup>	Slope Factor Lifetime Excess Total Cancer Risk Per Unit Intake or Exposure		
						Ingestion (Risk/pCi)	Inhalation (Risk/pCi)	External Exposure (Risk/yr per pCi/g soil)
Xenon (54)	Xe-127	013994-19-9	3.640E+01 D	•	1.0E+00	—	4.0E-16	5.0E-07
	Xe-129m	013965-99-6(m)	8.890E+00 D	•	1.0E+00	—	6.0E-16	1.3E-08
	Xe-131m	014683-11-5(m)	1.180E+01 D	•	1.0E+00	—	4.3E-16	4.5E-09
	Xe-133	014932-42-4	5.250E+00 D	•	1.0E+00	—	4.3E-16	2.3E-08
	Xe-133m	014932-42-4(m)	2.190E+00 D	•	1.0E+00	—	5.4E-16	3.3E-08
	Xe-135	014995-62-1	9.110E+00 H	*	1.0E+00	—	8.0E-16	6.2E-07
	Xe-135m	014995-62-1(m)	1.540E+01 M	•	1.0E+00	—	2.1E-16	1.3E-06
	Xe-137	014835-21-3	3.830E+00 M	•	1.0E+00	—	1.8E-15	6.0E-07
	Xe-138	015751-81-2	1.410E+01 M	•	1.0E+00	—	2.8E-15	4.0E-06
Yttrium (39)	Y-80 <sup>†</sup>	010098-91-6	6.410E+01 H	Y	1.0E-04	3.2E-12	5.5E-12	0.0E+00
	Y-91	014234-24-3	5.850E+01 D	Y	1.0E-04	2.8E-12	4.8E-11	1.2E-08
	Y-91m	014234-24-3(m)	4.970E+01 M	Y	1.0E-04	2.2E-14	3.5E-14	1.7E-06
	Y-92	015751-59-4	3.540E+00 H	Y	1.0E-04	7.1E-13	5.8E-13	8.6E-07
	Y-93	014981-70-5	1.010E+01 H	Y	1.0E-04	1.4E-12	1.4E-12	3.0E-07
Zinc (30)	Zn-65	013982-39-3	2.440E+02 D	Y	5.0E-01	8.5E-12	1.6E-11	2.0E-06

## Radionuclide Carcinogenicity From HEAST – Slope Factors<sup>a</sup> (In Units of Picocuries<sup>b</sup>)

Element (Atomic Number)	Isotope <sup>c</sup>	CASRN <sup>d</sup>	Radioactive Half-life <sup>e</sup>	ICRP Lung Class <sup>f</sup>	GI Absorption Factor ( $f_i$ ) <sup>g</sup>	Slope Factor Lifetime Excess Total Cancer Risk Per Unit Intake or Exposure		
						Ingestion (Risk/pCi)	Inhalation (Risk/pCi)	External Exposure (Risk/yr per pCi/g soil)
Zirconium (40)	Zn-69	013982-23-5	5.560E+01 M	Y	5.0E-01	5.6E-14	3.2E-14	1.8E-11
	Zn-69m	013982-23-5(m)	1.380E+01 H	Y	5.0E-01	4.3E-13	5.7E-13	1.3E-06
	Zr-83	015751-77-6	1.530E+08 Y	W	2.0E-03	1.7E-13	6.5E-12	0.0E+00
	Zr-85	013967-71-0	8.400E+01 D	W	2.0E-03	9.0E-13	1.0E-11	2.5E-06
	Zr-97	014928-30-4	1.690E+01 H	W	2.0E-03	2.4E-12	2.5E-12	6.1E-07

<sup>a</sup> Calculated by the EPA Office of Radiation and Indoor Air; as presented in HEAST, Annual Update, FY1993 (March). EPA classifies all radionuclides as Group A carcinogens. Radionuclide slope factors are calculated to assist HEAST users with risk-related evaluations and decision-making at various stages of the remediation process. Ingestion and Inhalation slope factors are best estimates (i.e., median or 50th percentile values) of the age-averaged, lifetime excess cancer incidence (fatal and nonfatal cancer) risk per unit of activity inhaled or ingested, expressed as risk/picocurie (pCi). External exposure slope factors are best estimates of the lifetime excess cancer incidence risk for each year of exposure to external radiation from photon-emitting radionuclides distributed uniformly in a thick layer of soil, and are expressed as risk/yr per pCi/gram of soil.

<sup>b</sup> A curie (Ci), the customary unit of activity, is equal to  $3.7 \times 10^{10}$  nuclear transformations per second. 1 picocurie (pCi) =  $10^{-12}$  Ci.

<sup>c</sup> For each radionuclide listed, corresponding slope factors are the risks per unit intake or exposure for that radionuclide only, except when marked with a '+D' to indicate that the risks from radioactive decay chain products are also included. Radionuclides designated with a 'Y' are members of a decay chain.

<sup>d</sup> Chemical Abstract Service Reference Number. For risk calculations involving decay chains, a CASRN should be reported for the parent radionuclide and each chain member.

<sup>e</sup> Radioactive half-life: S = Second, M = Minute, D = Day, Y = Year. For those radionuclides with decay products (+D), half-lives are listed for the parent radionuclide.

<sup>f</sup> Lung clearance classification recommended by the International Commission on Radiological Protection (ICRP): Y = Year, W = Week, D = Day, \* = Gas.

<sup>g</sup> GI absorption factors are the fractional amount of the radionuclide absorbed across the GI tract into the bloodstream. Lung clearance classifications and GI absorption values are provided for reference only. Do not use these factors to adjust (i.e., multiply or divide) Inhalation or Ingestion slope factors. See the User's Guide for instructions.

**RADIONUCLIDE CARCINOGENICITY FROM HEAST  
SLOPE FACTORS IN BECQUERELS**

**OCTOBER 1994**

**Radionuclide Carcinogenicity From HEAST– Slope Factors<sup>a</sup>  
(In Units of Becquerels<sup>b</sup>)**

Element (Atomic Number)	Isotope <sup>c</sup>	CASRN <sup>d</sup>	Radioactive Half-life <sup>e</sup>	ICRP Lung Class <sup>f</sup>	GI Absorption Factor ( $f_1$ ) <sup>g</sup>	Slope Factor Lifetime Excess Total Cancer Risk Per Unit Intake or Exposure		
						Ingestion (Risk/Bq)	Inhalation (Risk/Bq)	External Exposure (Risk/yr per Bq/g soil)
Actinium (89)	Ac-225 <sup>†</sup>	014265-85-1	1.000E+01 D	Y	1.0E-03	4.6E-10	6.5E-08	2.1E-07
	Ac-227 <sup>†</sup>	014952-40-0	2.180E+01 Y	Y	1.0E-03	7.6E-09	2.2E-06	7.0E-10
	Ac-227+D	014952-40-0(+D)	2.180E+01 Y	Y	1.0E-03	9.5E-09	2.4E-06	2.3E-05
	Ac-228	014331-63-0	6.130E+00 H	Y	1.0E-03	1.4E-11	7.0E-10	7.8E-05
Americium (95)	Am-241 <sup>†</sup>	014596-10-2	4.320E+02 Y	W	1.0E-03	6.5E-09	8.6E-07	1.3E-07
	Am-242	013981-54-9	1.600E+01 H	W	1.0E-03	9.7E-12	3.2E-10	1.6E-07
	Am-242m	013981-54-9(m)	1.520E+02 Y	W	1.0E-03	6.2E-09	7.6E-07	3.2E-09
	Am-243 <sup>†</sup>	014993-75-0	7.380E+03 Y	W	1.0E-03	6.5E-09	8.6E-07	6.5E-07
	Am-243+D	014993-75-0(+D)	7.380E+03 Y	W	1.0E-03	6.5E-09	8.6E-07	6.8E-06
Antimony (51)	Sb-122	014374-79-9	2.700E+00 D	W	1.0E-01	5.4E-11	9.2E-11	3.8E-05
	Sb-124	014683-10-4	6.020E+01 D	W	1.0E-01	7.8E-11	5.9E-10	1.8E-04
	Sb-125	014234-35-6	2.770E+00 Y	W	1.0E-01	2.3E-11	3.0E-10	3.2E-05
	Sb-126	015756-32-8	1.240E+01 D	W	1.0E-01	7.6E-11	2.4E-10	2.5E-04
	Sb-126m	015756-32-8(m)	1.900E+01 M	W	1.0E-01	1.9E-12	7.0E-13	1.4E-04
	Sb-127 <sup>†</sup>	013968-50-8	3.850E+00 D	W	1.0E-01	5.4E-11	1.1E-10	5.7E-05

**Radionuclide Carcinogenicity From HEAST– Slope Factors<sup>a</sup>  
(In Units of Becquerels<sup>b</sup>)**

Element (Atomic Number)	Isotope <sup>c</sup>	CASRN <sup>d</sup>	Radioactive Half-life <sup>e</sup>	ICRP Lung Class <sup>f</sup>	GI Absorption Factor ( $F_1$ ) <sup>g</sup>	Slope Factor Lifetime Excess Total Cancer Risk Per Unit Intake or Exposure		
						Ingestion (Risk/Bq)	Inhalation (Risk/Bq)	External Exposure (Risk/yr per Bq/g soil)
Sodium (11)	Sb-129	014331-88-5	4.400E+00 H	W	1.0E-01	1.6E-11	1.4E-11	1.3E-04
Argon (18)	Ar-41	014163-25-8	1.830E+00 H	•	1.0E+00	—	1.6E-14	1.2E-04
Astatine (85)	At-217 <sup>†</sup>	017239-90-6	3.230E-02 S	D	1.0E+00	1.2E-16	1.5E-15	2.1E-08
Barium (56)	Ba-131	014914-75-1	1.180E+01 D	D	1.0E-01	1.3E-11	9.7E-12	3.2E-05
	Ba-133	013981-41-4	1.050E+01 Y	D	1.0E-01	3.2E-11	9.7E-11	2.3E-05
	Ba-133m	013981-41-4(m)	3.890E+01 H	D	1.0E-01	1.7E-11	9.5E-12	2.6E-06
	Ba-137m <sup>†</sup>	013981-97-0(m)	2.550E+00 M	D	1.0E-01	6.5E-14	1.6E-14	5.4E-05
	Ba-139	014378-25-7	8.310E+01 M	D	1.0E-01	5.7E-12	4.1E-12	2.1E-06
	Ba-140	014798-08-4	1.280E+01 D	D	1.0E-01	7.3E-11	5.4E-11	1.5E-05
Beryllium (4)	Be-7	013986-02-4	5.340E+01 D	Y	5.0E-03	8.1E-13	7.3E-12	4.1E-06
Bismuth (83)	Bi-206	015776-19-9	6.240E+00 D	W	5.0E-02	5.9E-11	1.2E-10	3.0E-04
	Bi-207	013982-38-2	3.340E+01 Y	W	5.0E-02	3.8E-11	4.9E-10	1.3E-04
	Bi-210 <sup>†</sup>	014331-79-4	5.010E+00 D	W	5.0E-02	4.3E-11	2.2E-09	0.0E+00
	Bi-211 <sup>†</sup>	015229-37-5	2.130E+00 M	W	5.0E-02	3.3E-13	5.2E-12	3.6E-06
	Bi-212 <sup>†</sup>	014913-49-6	6.055E+01 M	W	5.0E-02	8.4E-12	1.8E-10	1.6E-05

**Radionuclide Carcinogenicity From HEAST— Slope Factors<sup>a</sup>  
(In Units of Becquerels<sup>b</sup>)**

Element (Atomic Number)	Isotope <sup>c</sup>	CASRN <sup>d</sup>	Radioactive Half-life <sup>e</sup>	ICRP Lung Class <sup>f</sup>	GI Absorption Factor ( $f_g$ ) <sup>g</sup>	Slope Factor Lifetime Excess Total Cancer Risk Per Unit Intake or Exposure		
						Ingestion (Risk/Bq)	Inhalation (Risk/Bq)	External Exposure (Risk/yr per Bq/g soil)
	Bi-213 <sup>†</sup>	015776-20-2	4.570E+01 M	W	5.0E-02	6.2E-12	8.1E-12	1.1E-05
	Bi-214 <sup>†</sup>	014733-03-0	1.990E+01 M	W	5.0E-02	3.5E-12	5.7E-11	1.4E-04
Bromine (35)	Br-82	014686-69-2	3.530E+01 H	D	1.0E+00	3.0E-11	2.4E-11	2.4E-04
Cadmium (20)	Cd-109	014109-32-1	4.640E+02 D	Y	5.0E-02	2.1E-10	1.8E-09	2.0E-08
	Cd-115	014336-68-6	5.350E+01 H	Y	5.0E-02	4.6E-11	7.0E-11	1.7E-05
	Cd-115m	014336-68-6(m)	4.460E+01 D	Y	5.0E-02	1.4E-10	1.1E-09	2.0E-06
Calcium (20)	Ca-45	013966-05-7	1.630E+02 D	W	3.0E-01	2.7E-11	1.4E-10	1.6E-16
	Ca-47	001439-99-2	4.540E+00 D	W	3.0E-01	5.4E-11	1.2E-10	9.7E-05
Carbon (6)	C-11	014333-33-6	2.060E+01 M	D	1.0E+00	1.3E-12	5.7E-13	8.6E-05
	C-14	014762-75-5	5.730E+03 Y	•	1.0E+00	2.4E-11	1.7E-13	0.0E+00
	C-15	015929-23-4	2.450E+00 S	D	1.0E+00	2.2E-14	5.7E-15	—
Cerium (58)	Ce-141	013967-74-3	3.250E+01 D	Y	3.0E-04	2.2E-11	2.3E-10	3.5E-08
	Ce-143	014119-19-6	3.300E+01 H	Y	3.0E-04	3.5E-11	5.9E-11	1.8E-05
	Ce-144	014762-78-8	2.610E+02 D	Y	3.0E-04	1.6E-10	9.2E-09	6.8E-07
Cesium (55)	Cs-131	014914-76-2	9.690E+00 D	D	1.0E+00	3.8E-12	2.7E-12	7.6E-08

**Radionuclide Carcinogenicity From HEAST– Slope Factors<sup>a</sup>  
(In Units of Becquerels<sup>b</sup>)**

Element (Atomic Number)	Isotope <sup>c</sup>	CASRN <sup>d</sup>	Radioactive Half-life <sup>e</sup>	ICRP Lung Class <sup>f</sup>	GI Absorption Factor ( $f_1$ ) <sup>g</sup>	Slope Factor Lifetime Excess Total Cancer Risk Per Unit Intake or Exposure		
						Ingestion (Risk/Bq)	Inhalation (Risk/Bq)	External Exposure (Risk/yr per Bq/g soft)
Cesium (37)	Cs-134	013967-70-9	2.060E+00 Y	D	1.0E+00	1.1E-09	7.6E-10	1.4E-04
	Cs-134m	013967-70-9(m)	2.900E+00 H	D	1.0E+00	1.1E-12	1.1E-12	5.4E-07
	Cs-135	015726-30-4	2.300E+06 Y	D	1.0E+00	1.1E-10	7.3E-11	0.0E+00
	Cs-136	014234-29-8	1.320E+01 D	D	1.0E+00	1.8E-10	1.2E-10	1.9E-04
	Cs-137 <sup>†</sup>	010045-97-3	3.020E+01 Y	D	1.0E+00	7.6E-10	5.1E-10	0.0E+00
	Cs-137+D	010045-97-3(+D)	3.020E+01 Y	D	1.0E+00	7.6E-10	5.1E-10	5.4E-05
	Cs-138	015758-29-9	3.220E+01 M	D	1.0E+00	5.1E-12	2.6E-12	2.2E-04
	Chlorine (17)	Cl-36	3.010E+05 Y	D	1.0E+00	4.9E-11	3.8E-11	0.0E+00
Chromium (24)	Cl-38	014158-34-0	3.720E+01 M	D	1.0E+00	6.2E-12	3.5E-12	1.5E-04
	Cr-51	014392-02-0	2.770E+01 D	Y	1.0E-01	1.2E-12	8.1E-12	2.5E-06
	Cobalt (27)	Co-57	013981-50-5	2.710E+02 D	Y	3.0E-01	1.6E-11	2.2E-10
	Co-58	013981-38-9	7.080E+01 D	Y	3.0E-01	4.3E-11	2.6E-10	8.9E-05
Copper (29)	Co-58m	013981-38-9(m)	9.150E+00 H	Y	3.0E-01	8.6E-13	2.0E-12	1.3E-09
	Co-60	010198-40-0	5.270E+00 Y	Y	3.0E-01	4.1E-10	4.1E-09	2.3E-04
	Copper (29)	Cu-64	1.270E+01 H	Y	5.0E-01	4.6E-12	5.4E-12	1.6E-05

**Radionuclide Carcinogenicity From HEAST – Slope Factors<sup>a</sup>  
(In Units of Becquerels<sup>b</sup>)**

Element (Atomic Number)	Isotope <sup>c</sup>	CASRN <sup>d</sup>	Radioactive Half-Life <sup>e</sup>	ICRP Lung Class <sup>f</sup>	GI Absorption Factor ( $f_g$ ) <sup>g</sup>	Slope Factor Lifetime Excess Total Cancer Risk Per Unit Intake or Exposure		
						Ingestion (Risk/Bq)	Inhalation (Risk/Bq)	External Exposure (Risk/yr per Bq/g soil)
Curium (96)	Cm-242	015510-73-3	1.630E+02 D	W	1.0E-03	3.5E-10	1.1E-07	9.2E-10
	Cm-243	015757-87-6	2.850E+01 Y	W	1.0E-03	5.1E-09	7.0E-07	4.3E-06
	Cm-244	013981-15-2	1.810E+01 Y	W	1.0E-03	4.3E-09	5.9E-07	8.1E-10
	Cm-245	015621-76-8	8.500E+03 Y	W	1.0E-03	6.5E-09	8.6E-07	1.4E-06
	Cm-246	015757-80-1	4.750E+03 Y	W	1.0E-03	6.5E-09	8.6E-07	7.3E-10
	Cm-247	015758-32-4	1.560E+07 Y	W	1.0E-03	5.9E-09	8.1E-07	2.5E-05
	Cm-248	015758-33-5	3.390E+05 Y	W	1.0E-03	2.5E-08	3.2E-06	5.9E-10
Dysprosium (66)	Dy-165	013967-64-1	2.330E+00 H	W	3.0E-04	4.1E-12	3.0E-12	1.5E-06
	Dy-166	015840-01-4	8.160E+01 H	W	3.0E-04	5.1E-11	1.4E-10	7.3E-07
Erblum (63)	Er-169	015840-13-8	9.400E+00 D	W	3.0E-04	1.2E-11	4.1E-11	2.3E-10
	Er-171	014391-45-8	7.520E+00 H	W	3.0E-04	1.2E-11	1.1E-11	2.5E-05
Europium (63)	Eu-152	014683-23-9	1.360E+01 Y	W	1.0E-03	5.7E-11	3.0E-09	9.7E-05
	Eu-154	015585-10-1	8.800E+00 Y	W	1.0E-03	8.1E-11	3.8E-09	1.1E-04
	Eu-155	014391-16-3	4.960E+00 Y	W	1.0E-03	1.2E-11	4.9E-10	1.6E-06
	Eu-156	014260-35-4	1.520E+01 D	W	1.0E-03	6.8E-11	3.0E-10	1.3E-04

**Radionuclide Carcinogenicity From HEAST – Slope Factors<sup>a</sup>  
(In Units of Becquerels<sup>b</sup>)**

Element (Atomic Number)	Isotope <sup>c</sup>	CASRN <sup>d</sup>	Radioactive Half-Life <sup>e</sup>	ICRP Lung Class <sup>f</sup>	GI Absorption Factor ( $f_1$ ) <sup>g</sup>	Slope Factor Lifetime Excess Total Cancer Risk Per Unit Intake or Exposure		
						Ingestion (Risk/Bq)	Inhalation (Risk/Bq)	External Exposure (Risk/yr per Bq/g soil)
Florin (9)	F-18	013981-56-1	1.100E+02 M	D	1.0E+00	2.6E-12	1.9E-12	8.4E-05
Francium (87)	Fr-221 <sup>†</sup>	015756-41-0	4.800E+00 M	D	1.0E+00	1.6E-12	2.5E-11	1.7E-06
	Fr-223 <sup>†</sup>	015756-98-6	2.180E+00 M	D	1.0E+00	4.6E-12	1.1E-11	1.1E-06
Gadolinium (64)	Gd-153	014276-65-4	2.420E+02 D	W	3.0E-04	8.4E-12	1.6E-10	2.0E-06
	Gd-159	014041-42-0	1.860E+01 H	W	3.0E-04	1.6E-11	1.7E-11	2.4E-06
Gallium (31)	Ga-67	014119-09-6	3.260E+00 D	W	1.0E-03	5.7E-12	9.7E-12	8.9E-06
	Ga-72	013982-22-4	1.410E+01 H	W	1.0E-03	3.5E-11	3.2E-11	2.6E-04
Germanium (32)	Ge-71	014374-81-3	1.180E+01 D	W	1.0E+00	1.8E-13	3.5E-12	6.2E-10
Gold (79)	Au-196	014914-16-0	6.180E+00 D	Y	1.0E-01	1.1E-11	2.4E-11	3.5E-05
	Au-198	010043-49-0	2.700E+00 D	Y	1.0E-01	3.2E-11	5.7E-11	3.2E-05
Holmium (67)	Ho-166	013987-65-2	2.680E+01 H	W	3.0E-04	4.6E-11	5.9E-11	1.8E-06
Hydrogen (1)	H-3	010028-17-8	1.230E+01 Y	*	1.0E+00	1.5E-12	2.1E-12	0.0E+00
Indium (49)	In-113m	014885-78-0(m)	1.660E+00 H	W	2.0E-02	1.3E-12	7.8E-13	1.9E-05
	In-114	013981-55-0	7.190E+01 S	W	2.0E-02	1.5E-13	4.1E-14	2.7E-06
	In-114m <sup>†</sup>	013981-55-0(m)	4.950E+01 D	W	2.0E-02	1.5E-10	1.1E-09	4.9E-06

**Radionuclide Carcinogenicity From HEAST – Slope Factors<sup>a</sup>  
(In Units of Becquerels<sup>b</sup>)**

Element (Atomic Number)	Isotope <sup>c</sup>	CASRN <sup>d</sup>	Radioactive Half-Life <sup>e</sup>	ICRP Lung Class <sup>f</sup>	GI Absorption Factor (f <sub>1</sub> ) <sup>g</sup>	Slope Factor Lifetime Excess Total Cancer Risk Per Unit Intake or Exposure		
						Ingestion (Risk/Bq)	Inhalation (Risk/Bq)	External Exposure (Riek/yr per Bq/g soil)
Iodine (53)	In-115	014191-71-0	4.600E+15 Y	W	2.0E-02	8.6E-10	5.9E-09	0.0E+00
	In-115m	014191-71-0(m)	4.360E+00 H	W	2.0E-02	3.2E-12	2.5E-12	1.1E-05
	I-122	018287-75-7	3.620E+00 M	D	1.0E+00	6.8E-13	2.1E-13	8.1E-05
	I-123	015715-08-9	1.310E+01 H	D	1.0E+00	2.7E-11	1.5E-11	6.5E-06
	I-125	014158-31-7	6.010E+01 D	D	1.0E+00	2.1E-10	1.4E-10	7.8E-08
	I-126	014158-32-8	1.290E+01 D	D	1.0E+00	4.1E-10	2.6E-10	3.5E-06
	I-129	015048-84-1	1.570E+07 Y	D	1.0E+00	5.1E-09	3.2E-09	1.1E-07
	I-130	014914-02-4	1.240E+01 H	D	1.0E+00	2.5E-10	1.4E-10	1.9E-04
	I-131	010048-66-0	8.040E+00 D	D	1.0E+00	9.7E-10	6.5E-10	4.1E-05
	I-132	014683-16-0	2.300E+00 H	D	1.0E+00	2.7E-11	1.6E-11	2.1E-04
Iridium (77)	I-133	014834-67-4	2.080E+01 H	D	1.0E+00	5.7E-10	3.2E-10	5.4E-05
	I-134	014914-27-3	5.260E+01 M	D	1.0E+00	7.6E-12	4.3E-12	2.4E-04
Iridium (77)	I-135	014834-68-5	6.610E+00 H	D	1.0E+00	1.1E-10	6.5E-11	1.5E-04
	Ir-190	014981-91-0	1.180E+01 D	Y	1.0E-02	3.8E-11	1.3E-10	1.1E-04
Iridium (77)	Ir-192	014694-69-0	7.400E+01 D	Y	1.0E-02	4.6E-11	7.3E-10	6.5E-05

**Radionuclide Carcinogenicity From HEAST– Slope Factors<sup>a</sup>  
(In Units of Becquerels<sup>b</sup>)**

Element (Atomic Number)	Isotope <sup>c</sup>	CASRN <sup>d</sup>	Radioactive Half-life <sup>e</sup>	ICRP Lung Class <sup>f</sup>	GI Absorption Factor ( $F_g$ ) <sup>g</sup>	Slope Factor Lifetime Excess Total Cancer Risk Per Unit Intake or Exposure		
						Ingestion (Risk/Bq)	Inhalation (Risk/Bq)	External Exposure (Risk/yr per Bq/g soil)
Iron (26)	Ir-194	014158-35-1	1.920E+01 H	Y	1.0E-02	4.3E-11	4.9E-11	7.6E-06
	Fe-55	014681-59-5	2.700E+00 Y	W	1.0E-01	7.3E-12	2.3E-11	0.0E+00
	Fe-59	014586-12-4	4.460E+01 D	W	1.0E-01	7.6E-11	2.6E-10	1.1E-04
Krypton (36)	Kr-83m	013985-98-5(m)	1.630E+00 H	*	1.0E+00	—	1.7E-15	9.2E-10
	Kr-85	013983-27-2	1.070E+01 Y	*	1.0E+00	—	1.3E-15	1.9E-07
	Kr-85m	013983-27-2(m)	4.480E+00 H	*	1.0E+00	—	1.3E-14	9.2E-06
	Kr-87	014809-68-8	7.630E+01 M	*	1.0E+00	—	5.9E-14	7.6E-05
	Kr-88	014995-61-0	2.840E+00 H	*	1.0E+00	—	1.3E-13	2.0E-04
	Kr-89	016316-03-3	3.160E+00 M	*	1.0E+00	—	7.0E-14	1.8E-04
	Kr-90	015741-13-6	3.230E+01 S	*	1.0E+00	—	6.5E-14	1.1E-04
	La-140	013981-28-7	4.020E+01 H	W	1.0E-03	6.2E-11	8.1E-11	2.2E-04
Lead (82)	Pb-203	014687-25-3	5.200E+01 H	D	2.0E-01	8.6E-12	7.0E-12	1.6E-05
	Pb-209 <sup>t</sup>	014119-30-3	3.250E+00 H	D	2.0E-01	2.3E-12	1.9E-12	0.0E+00
	Pb-210 <sup>t</sup>	014255-04-0	2.230E+01 Y	D	2.0E-01	1.4E-08	3.5E-08	3.5E-09
	Pb-210+D	014255-04-0(+D)	2.230E+01 Y	D	2.0E-01	1.8E-08	1.1E-07	4.3E-09

**Radionuclide Carcinogenicity From HEAST– Slope Factors<sup>a</sup>  
(In Units of Becquerels<sup>b</sup>)**

Element (Atomic Number)	Isotope <sup>c</sup>	CASRN <sup>d</sup>	Radioactive Half-life <sup>e</sup>	ICRP Lung Class <sup>f</sup>	GI Absorption Factor ( $F_1$ ) <sup>g</sup>	Slope Factor Lifetime Excess Total Cancer Risk Per Unit Intake or Exposure		
						Ingestion (Risk/Bq)	Inhalation (Risk/Bq)	External Exposure (Risk/yr per Bq/g soil)
Lead (82)	Pb-211 <sup>†</sup>	015816-77-0	3.610E+01 M	D	2.0E-01	4.9E-12	7.6E-11	4.3E-06
	Pb-212 <sup>†</sup>	015092-94-1	1.060E+01 H	D	2.0E-01	1.5E-10	1.2E-09	7.6E-06
	Pb-214 <sup>†</sup>	015067-28-4	2.680E+01 M	D	2.0E-01	4.6E-12	7.8E-11	1.7E-05
Lutetium (71)	Lu-177	014265-75-9	6.710E+00 D	Y	3.0E-04	1.7E-11	5.1E-11	1.8E-06
Manganese (25)	Mn-52	014092-99-0	5.590E+00 D	W	1.0E-01	5.9E-11	1.0E-10	3.2E-04
	Mn-54	013966-31-9	3.130E+02 D	W	1.0E-01	3.0E-11	1.4E-10	7.8E-05
	Mn-56	014681-52-8	2.580E+00 H	W	1.0E-01	1.1E-11	7.6E-12	1.6E-04
Mercury (80)	Hg-197	013981-51-6	6.410E+01 H	W	2.0E-02	7.3E-12	1.2E-11	1.5E-06
	Hg-203	013982-78-0	4.660E+01 D	W	2.0E-02	1.8E-11	1.3E-10	1.5E-05
Molybdenum (42)	Mo-99	014119-15-4	6.600E+01 H	Y	8.0E-01	4.1E-11	7.0E-11	1.3E-05
Neodymium (60)	Nd-147	014269-74-0	1.100E+01 D	Y	3.0E-04	3.5E-11	1.5E-10	8.1E-06
	Nd-149	015749-81-2	1.730E+00 H	Y	3.0E-04	5.1E-12	4.3E-12	2.6E-05
Neptunium (93)	Np-236	015700-36-4	1.150E+05 Y	W	1.0E-03	6.2E-12	1.1E-10	2.4E-06
	Np-237 <sup>†</sup>	013994-20-2	2.140E+06 Y	W	1.0E-03	5.9E-09	7.8E-07	2.1E-07
	Np-237+D	013994-20-2(+D)	2.140E+06 Y	W	1.0E-03	5.9E-09	7.8E-07	1.2E-05

**Radionuclide Carcinogenicity From HEAST– Slope Factors<sup>a</sup>  
(In Units of Becquerels<sup>b</sup>)**

Element (Atomic Number)	Isotope <sup>c</sup>	CASRN <sup>d</sup>	Radioactive Half-life <sup>e</sup>	ICRP Lung Class <sup>f</sup>	GI Absorption Factor ( $f_1$ ) <sup>g</sup>	Slope Factor Lifetime Excess Total Cancer Risk Per Unit Intake or Exposure		
						Ingestion (Risk/Bq)	Inhalation (Risk/Bq)	External Exposure (Risk/yr per Bq/g soil)
Neptunium (93)	Np-238	015766-25-3	2.120E+00 D	W	1.0E-03	3.0E-11	8.9E-11	4.6E-05
	Np-239 <sup>t</sup>	013968-59-7	2.360E+00 D	W	1.0E-03	2.5E-11	4.1E-11	6.2E-06
	Np-240	015690-84-3	6.500E+01 M	W	1.0E-03	3.5E-12	1.8E-12	8.6E-05
	Np-240m	015690-84-3(m)	7.400E+00 M	W	1.0E-03	7.8E-13	2.4E-13	2.5E-05
	Nickel (28)	Ni-59	014336-70-0	7.500E+04 Y	W	5.0E-02	2.5E-12	1.9E-11
Niobium (41)	Ni-63	013981-37-8	1.000E+02 Y	W	5.0E-02	6.5E-12	4.9E-11	0.0E+00
	Ni-65	014833-49-9	2.520E+00 H	W	5.0E-02	7.0E-12	5.1E-12	5.1E-05
	Nb-83m	007440-03-1(m)	1.460E+01 Y	Y	1.0E-02	4.1E-12	5.1E-10	1.4E-09
	Nb-94	014681-63-1	2.030E+04 Y	Y	1.0E-02	5.7E-11	5.7E-09	1.5E-04
	Nb-95	013967-76-5	3.510E+01 D	Y	1.0E-02	1.8E-11	1.4E-10	7.0E-05
Osmium (76)	Nb-95m	013967-76-5(m)	8.660E+01 H	Y	1.0E-02	1.8E-11	4.3E-11	2.2E-06
	Nb-97	018496-04-3	7.210E+01 M	Y	1.0E-02	3.2E-12	1.9E-12	5.9E-05
	Nb-97m	018496-04-3(m)	6.000E+01 S	Y	1.0E-02	6.5E-14	3.0E-14	6.8E-05
	Os-185	015766-50-4	9.360E+01 D	Y	1.0E-02	1.7E-11	2.4E-10	5.9E-05
	Os-191	014119-24-5	1.540E+01 D	Y	1.0E-02	1.8E-11	9.7E-11	2.3E-06

**Radionuclide Carcinogenicity From HEAST– Slope Factors<sup>a</sup>  
(In Units of Becquerels<sup>b</sup>)**

Element (Atomic Number)	Isotope <sup>c</sup>	CASRN <sup>d</sup>	Radioactive Half-life <sup>e</sup>	ICRP Lung Class <sup>f</sup>	GI Absorption Factor (f <sub>g</sub> ) <sup>g</sup>	Slope Factor Lifetime Excess Total Cancer Risk Per Unit Intake or Exposure		
						Ingestion (Risk/Bq)	Inhalation (Risk/Bq)	External Exposure (Risk/yr per Bq/g soil)
Palladium (46)	Os-191m	014119-24-5(m)	1.300E+01 H	Y	1.0E-02	3.2E-12	5.7E-12	9.2E-08
	Os-193	016057-77-5	3.000E+01 H	Y	1.0E-02	2.6E-11	3.2E-11	4.6E-06
	Pd-100	015690-69-4	3.640E+00 D	Y	5.0E-03	2.7E-11	6.2E-11	—
	Pd-101	015749-54-9	8.480E+00 H	Y	5.0E-03	3.2E-12	3.0E-12	—
	Pd-103	014967-68-1	1.700E+01 D	Y	5.0E-03	5.9E-12	3.8E-11	2.0E-08
	Pd-107	017637-99-9	6.500E+08 Y	Y	5.0E-03	1.2E-12	1.7E-10	0.0E+00
Phosphorus (15)	Pd-109	014981-64-7	1.350E+01 H	Y	5.0E-03	2.1E-11	2.2E-11	5.9E-08
	P-32	014596-37-3	1.430E+01 D	D	8.0E-01	9.5E-11	8.1E-11	0.0E+00
	P-33	015749-66-3	2.540E+01 D	D	8.0E-01	1.5E-11	1.2E-11	0.0E+00
Platinum (78)	Pt-191	015706-36-2	2.710E+00 D	D	1.0E-02	1.0E-11	8.1E-12	1.7E-05
	Pt-193	015735-70-3	5.000E+01 Y	D	1.0E-02	9.5E-13	2.2E-12	0.0E+00
	Pt-193m	015735-70-3(m)	4.330E+00 D	D	1.0E-02	1.4E-11	1.1E-11	2.1E-07
	Pt-197	015735-74-7	1.830E+01 H	D	1.0E-02	1.3E-11	8.6E-12	8.4E-07
	Pt-197m	015735-74-7(m)	9.440E+01 M	D	1.0E-02	3.2E-12	2.4E-12	4.3E-06
Plutonium (94)	Pu-236 *	015411-92-4	2.850E+00 Y	Y	1.0E-03	1.4E-09	6.5E-07	9.2E-10

**Radionuclide Carcinogenicity From HEAST– Slope Factors<sup>a</sup>  
(In Units of Becquerels<sup>b</sup>)**

Element (Atomic Number)	Isotope <sup>c</sup>	CASRN <sup>d</sup>	Radioactive Half-Life <sup>e</sup>	ICRP Lung Class <sup>f</sup>	GI Absorption Factor ( $f_1$ ) <sup>g</sup>	Slope Factor Lifetime Excess Total Cancer Risk Per Unit Intake or Exposure		
						Ingestion (Risk/Bq)	Inhalation (Risk/Bq)	External Exposure (Risk/yr per Bq/g soil)
Plutonium (94)	Pu-238	013981-16-3	6.780E+01 Y	Y	1.0E-03	5.9E-09	1.1E-06	7.6E-10
	Pu-239	015117-48-3	2.410E+04 Y	Y	1.0E-03	6.2E-09	1.0E-06	4.6E-10
	Pu-240	014119-33-6	6.570E+03 Y	Y	1.0E-03	6.2E-09	1.0E-06	7.3E-10
	Pu-241	014119-32-5	1.440E+01 Y	Y	1.0E-03	9.7E-11	6.2E-09	0.0E+00
	Pu-242	013982-10-0	3.760E+05 Y	Y	1.0E-03	5.9E-09	9.7E-07	6.2E-10
	Pu-243	015706-37-3	4.960E+00 H	Y	1.0E-03	3.0E-12	2.7E-12	4.8E-07
	Pu-244	014119-34-7	8.260E+07 Y	Y	1.0E-03	5.9E-09	9.7E-07	5.1E-10
	Po-210 <sup>†</sup>	013981-52-7	1.380E+02 D	W	1.0E-01	4.1E-09	7.0E-08	7.8E-10
Polonium (84)	Po-212 <sup>†</sup>	015389-34-1	2.980E-07 S	W	1.0E-01	5.9E-22	1.6E-20	0.0E+00
	Po-213 <sup>†</sup>	015756-57-7	4.200E-06 S	W	1.0E-01	8.6E-21	2.2E-19	2.7E-09
	Po-214 <sup>†</sup>	015735-67-8	1.640E-04 S	W	1.0E-01	2.7E-19	7.6E-18	7.6E-09
	Po-215 <sup>†</sup>	015706-52-2	1.780E-03 S	W	1.0E-01	7.6E-18	1.5E-16	1.2E-08
	Po-216 <sup>†</sup>	015756-58-8	1.460E-01 S	W	1.0E-01	8.1E-16	1.3E-14	1.4E-09
	Po-218 <sup>†</sup>	015422-24-9	3.050E+00 M	W	1.0E-01	7.6E-13	1.6E-11	0.0E+00
	K-40	013986-00-2	1.280E+09 Y	D	1.0E+00	3.0E-10	2.1E-10	1.5E-05

**Radionuclide Carcinogenicity From HEAST – Slope Factors<sup>a</sup>  
(In Units of Becquerels<sup>b</sup>)**

Element (Atomic Number)	Isotope <sup>c</sup>	CASRN <sup>d</sup>	Radioactive Half-Life <sup>e</sup>	ICRP Lung, Class <sup>f</sup>	GI Absorption Factor ( $f_g$ ) <sup>g</sup>	Slope Factor Lifetime Excess Total Cancer Risk Per Unit Intake or Exposure		
						Ingestion (Risk/Bq)	Inhalation (Risk/Bq)	External Exposure (Risk/yr per Bq/g soil)
	K-42	014378-21-3	1.240E+01 H	D	1.0E+00	2.4E-11	3.2E-11	2.6E-05
Praseodymium (59)	Pr-142	014181-64-1	1.910E+01 H	Y	3.0E-04	4.3E-11	4.9E-11	5.7E-06
	Pr-143	014981-79-4	1.360E+01 D	Y	3.0E-04	3.8E-11	1.9E-10	8.1E-13
	Pr-144	014119-05-2	1.730E+01 M	Y	3.0E-04	2.6E-12	9.7E-13	3.2E-06
	Pr-144m	014119-05-2(m)	7.200E+00 M	Y	3.0E-04	1.0E-12	4.3E-13	5.7E-08
Promethium (61)	Pm-147	014380-75-7	2.620E+00 Y	Y	3.0E-04	8.4E-12	8.1E-10	1.6E-10
	Pm-148	014683-19-3	5.370E+00 D	Y	3.0E-04	8.4E-11	2.1E-10	5.1E-05
	Pm-148m	014683-19-3(m)	4.130E+01 D	Y	3.0E-04	6.8E-11	1.3E-09	1.8E-04
	Pm-149	015765-31-8	5.310E+01 H	Y	3.0E-04	3.2E-11	5.1E-11	8.9E-07
Protactinium (91)	Pa-231 <sup>†</sup>	014331-85-2	3.730E+04 Y	Y	1.0E-03	2.5E-09	9.7E-07	7.0E-07
	Pa-233 <sup>†</sup>	013981-14-1	2.700E+01 D	Y	1.0E-03	2.7E-11	2.3E-10	1.1E-05
	Pa-234	015100-28-4	6.700E+00 H	Y	1.0E-03	1.8E-11	1.5E-11	1.6E-04
	Pa-234m <sup>†</sup>	015100-28-4(m)	1.170E+00 M	Y	1.0E-03	1.6E-13	4.3E-14	9.7E-07
Radium (88)	Ra-223 <sup>†</sup>	015623-45-7	1.140E+01 D	W	2.0E-01	1.7E-09	8.4E-08	6.2E-06
	Ra-224 <sup>†</sup>	013233-32-4	3.620E+00 D	W	2.0E-01	1.0E-09	3.2E-08	6.2E-07

**Radionuclide Carcinogenicity From HEAST– Slope Factors<sup>a</sup>  
(In Units of Becquerels<sup>b</sup>)**

Element (Atomic Number)	Isotope <sup>c</sup>	CASRN <sup>d</sup>	Radioactive Half-life <sup>e</sup>	ICRP Lung, Class <sup>f</sup>	GI Absorption Factor ( $f_g$ ) <sup>g</sup>	Slope Factor Lifetime Excess Total Cancer Risk Per Unit Intake or Exposure		
						Ingestion (Risk/Bq)	Inhalation (Risk/Bq)	External Exposure (Risk/yr per Bq/g soil)
Radon (86)	Ra-225 <sup>†</sup>	013981-53-8	1.480E+01 D	W	2.0E-01	1.4E-09	4.1E-08	5.1E-08
	Ra-226 <sup>†</sup>	013982-63-3	1.600E+03 Y	W	2.0E-01	3.2E-09	8.1E-08	3.2E-07
	Ra-226+D	013982-63-3(+D)	1.600E+03 Y	W	2.0E-01	3.2E-09	8.1E-08	1.6E-04
	Ra-228 <sup>†</sup>	015262-20-1	5.750E+00 Y	W	2.0E-01	2.7E-09	1.8E-08	0.0E+00
	Ra-228+D	015262-20-1(+D)	5.750E+00 Y	W	2.0E-01	2.7E-09	1.9E-08	7.8E-05
	Rn-218 <sup>†</sup>	014835-02-0	3.960E+00 S	*	1.0E+00	—	1.2E-12	4.3E-06
	Rn-220 <sup>†</sup>	022481-48-7	5.560E+01 S	*	1.0E+00	—	3.2E-12	4.6E-06
	Rn-222 <sup>†</sup>	014859-67-7	3.820E+00 D	*	1.0E+00	3.8E-11	2.0E-11	3.2E-06
	Rn-222+D	014859-67-7(+D)	3.820E+00 D	*	1.0E+00	4.6E-11	2.1E-10	1.6E-04
	Rhodium (45)	Rh-103m	007440-16-6(m)	5.610E+01 M	Y	5.0E-02	1.9E-13	2.1E-09
Rubidium (37)	Rh-105	014913-89-4	3.540E+01 H	Y	5.0E-02	1.2E-11	1.6E-11	5.9E-06
	Rh-105m	014913-89-4(m)	4.500E+01 S	Y	5.0E-02	1.7E-14	9.2E-15	5.9E-07
	Rh-106	014234-34-5	2.990E+01 S	Y	5.0E-02	1.2E-13	3.2E-14	1.8E-05
	Rb-82	014391-63-0	1.250E+00 M	D	1.0E+00	3.2E-13	9.5E-14	9.5E-05
	Rb-86	014932-53-7	1.870E+01 D	D	1.0E+00	1.6E-10	1.2E-10	8.9E-06

**Radionuclide Carcinogenicity From HEAST– Slope Factors<sup>a</sup>  
(In Units of Becquerels<sup>b</sup>)**

Element (Atomic Number)	Isotope <sup>c</sup>	CASRN <sup>d</sup>	Radioactive Half-life <sup>e</sup>	ICRP Lung Class <sup>f</sup>	GI Absorption Factor (f <sub>1</sub> ) <sup>g</sup>	Slope Factor Lifetime Excess Total Cancer Risk Per Unit Intake or Exposure		
						Ingestion (Risk/Bq)	Inhalation (Risk/Bq)	External Exposure (Risk/yr per Bq/g soil)
Ruthenium (44)	Rb-87	013982-13-3	4.730E+10 Y	D	1.0E+00	9.2E-11	6.5E-11	0.0E+00
	Rb-88	014928-36-0	1.780E+01 M	D	1.0E+00	4.6E-12	2.1E-12	6.5E-05
	Rb-89	014191-65-2	1.540E+01 M	D	1.0E+00	2.5E-12	1.1E-12	2.0E-04
	Ru-87	015758-35-7	2.900E+00 D	Y	5.0E-02	4.6E-12	7.0E-12	1.1E-05
	Ru-103	013968-53-1	3.940E+01 D	Y	5.0E-02	2.4E-11	2.3E-10	4.1E-05
	Ru-105	014331-95-4	4.440E+00 H	Y	5.0E-02	1.0E-11	8.9E-12	7.0E-05
	Ru-106	013967-48-1	3.680E+02 D	Y	5.0E-02	2.6E-10	1.2E-08	0.0E+00
	Sm-147	014392-33-7	1.080E+11 Y	W	3.0E-04	4.3E-10	1.9E-07	0.0E+00
	Sm-151	015715-94-3	9.000E+01 Y	W	3.0E-04	3.0E-12	2.4E-10	1.1E-11
Scandium (21)	Sm-153	015766-00-4	4.670E+01 H	W	3.0E-04	2.4E-11	3.5E-11	1.2E-06
	Sc-46	013967-63-0	8.380E+01 D	Y	1.0E-04	4.3E-11	7.3E-10	1.9E-04
	Sc-47	014391-96-8	3.420E+00 D	Y	1.0E-04	1.7E-11	3.2E-11	6.2E-06
Selenium (34)	Sc-48	014391-86-7	4.370E+01 H	Y	1.0E-04	5.1E-11	6.2E-11	3.2E-04
	Se-75	014265-71-5	1.200E+02 D	W	8.0E-01	1.6E-10	1.6E-10	2.2E-05
Silicon (14)	Si-31	014276-49-4	1.570E+02 M	W	1.0E-02	5.9E-12	4.6E-12	8.1E-08

**Radionuclide Carcinogenicity From HEAST— Slope Factors<sup>a</sup>  
(In Units of Becquerels<sup>b</sup>)**

Element (Atomic Number)	Isotope <sup>c</sup>	CASRN <sup>d</sup>	Radioactive Half-life <sup>e</sup>	ICRP Lung, Class <sup>f</sup>	GI Absorption Factor ( $F_g$ ) <sup>g</sup>	Slope Factor Lifetime Excess Total Cancer Risk Per Unit Intake or Exposure		
						Ingestion (Risk/Bq)	Inhalation (Risk/Bq)	External Exposure (Risk/yr per Bq/g soil)
Silver (47)	Ag-105	014926-14-4	4.130E+01 D	Y	5.0E-02	2.0E-11	1.1E-10	-----
	Ag-106	014391-65-2	2.370E+00 M	Y	5.0E-02	2.3E-13	6.5E-14	1.4E-06
	Ag-106m	014391-65-2(m)	1.270E+02 Y	Y	5.0E-02	9.5E-11	4.1E-09	1.4E-04
	Ag-109m	014378-38-2(m)	3.980E+01 S	Y	5.0E-02	8.9E-15	2.4E-15	3.5E-08
	Ag-110	014391-76-5	2.460E+01 S	Y	5.0E-02	8.1E-14	2.2E-14	2.7E-06
	Ag-110m	014391-76-5(m)	2.500E+02 D	Y	5.0E-02	1.3E-10	1.9E-09	2.5E-04
	Ag-111	157690-04-0	7.460E+00 D	Y	5.0E-02	4.3E-11	1.3E-10	2.1E-06
Sodium (11)	Na-22	013966-32-0	2.600E+00 Y	D	1.0E+00	1.8E-10	1.3E-10	1.9E-04
	Na-24	013982-04-2	1.500E+01 H	D	1.0E+00	2.7E-11	2.6E-11	4.3E-04
Strontium (38)	Sr-82	014809-50-8	2.500E+01 D	D	3.0E-01	2.0E-10	1.9E-10	3.5E-09
	Sr-85	013967-73-2	6.480E+01 D	D	3.0E-01	2.1E-11	2.7E-11	3.8E-05
	Sr-85m	013967-73-2(m)	6.770E+01 M	D	3.0E-01	3.2E-13	1.6E-13	1.3E-05
	Sr-89	014158-27-1	5.060E+01 D	D	3.0E-01	8.1E-11	7.8E-11	1.3E-08
	Sr-90 <sup>t</sup>	010098-97-2	2.860E+01 Y	D	3.0E-01	8.9E-10	1.5E-09	0.0E+00
	Sr-90+D	010098-97-2(+D)	2.860E+01 Y	D	3.0E-01	9.7E-10	1.7E-09	0.0E+00

**Radionuclide Carcinogenicity From HEAST— Slope Factors<sup>a</sup>  
(In Units of Becquerels<sup>b</sup>)**

Element (Atomic Number)	Isotope <sup>c</sup>	CASRN <sup>d</sup>	Radioactive Half-life <sup>e</sup>	ICRP Lung, Class <sup>f</sup>	GI Absorption Factor ( $f_g$ ) <sup>g</sup>	Slope Factor Lifetime Excess Total Cancer Risk Per Unit Intake or Exposure		
						Ingestion (Risk/Bq)	Inhalation (Risk/Bq)	External Exposure (Risk/yr per Bq/g soil)
	Sr-91	014331-91-0	9.500E+00	H	3.0E-01	2.3E-11	1.9E-11	6.5E-05
	Sr-92	014928-29-1	2.710E+00	H	3.0E-01	1.5E-11	1.2E-11	1.2E-04
Sulfur (16)	S-35	015117-53-0	8.740E+01	D	8.0E-01	5.9E-12	5.1E-12	0.0E+00
Tantalum (73)	Ta-182	013982-00-8	1.150E+02	D	Y	1.0E-03	4.6E-11	1.2E-09
Technetium (43)	Tc-95	014809-56-4	2.000E+01	H	W	8.0E-01	1.5E-12	6.5E-05
	Tc-95m	014809-56-4(m)	8.100E+01	D	W	8.0E-01	4.9E-11	1.1E-10
	Tc-96	014808-44-7	4.280E+00	D	W	8.0E-01	4.9E-11	2.2E-04
	Tc-96m	014808-44-7(m)	5.150E+01	M	W	8.0E-01	8.2E-13	5.7E-13
	Tc-97	015759-35-0	2.600E+06	Y	W	8.0E-01	4.1E-12	2.6E-11
	Tc-97m	015759-35-0(m)	8.900E+01	D	W	8.0E-01	3.0E-11	1.4E-10
	Tc-99	014133-76-7	2.130E+05	Y	W	8.0E-01	3.5E-11	2.2E-10
	Tc-99m	014133-76-7(m)	8.020E+00	H	W	8.0E-01	1.4E-12	7.3E-13
Tellurium (52)	Te-125m	014390-73-9(m)	5.800E+01	D	W	2.0E-01	2.3E-11	1.5E-10
	Te-127	013981-49-2	8.350E+00	H	W	2.0E-01	6.2E-12	6.2E-12
	Te-127m	013981-49-2(m)	1.090E+02	D	W	2.0E-01	5.9E-11	4.3E-10

**Radionuclide Carcinogenicity From HEAST– Slope Factors<sup>a</sup>  
(In Units of Becquerels<sup>b</sup>)**

Element (Atomic Number)	Isotope <sup>c</sup>	CASRN <sup>d</sup>	Radioactive Half-life*	ICRP Lung, Class <sup>e</sup>	GI Absorption Factor ( $f_g$ ) <sup>g</sup>	Slope Factor Lifetime Excess Total Cancer Risk Per Unit Intake or Exposure		
						Ingestion (Pikel/Bq)	Inhalation (Pikel/Bq)	External Exposure (Pikel/yr per Bq/g soil)
Tellurium (52)	Te-129	014269-71-7	6.960E+01 M	W	2.0E-01	3.0E-12	1.8E-12	3.5E-06
	Te-129m	014269-71-7(m)	3.360E+01 D	W	2.0E-01	8.6E-11	5.4E-10	1.7E-06
	Te-131	014683-12-6	2.500E+01 M	W	2.0E-01	7.6E-12	3.8E-12	3.2E-05
	Te-131m	014683-12-6(m)	3.000E+01 H	W	2.0E-01	1.0E-10	1.5E-10	1.3E-04
	Te-132	014234-28-7	7.820E+01 H	W	2.0E-01	8.1E-11	1.4E-10	1.1E-05
	Tb-158	015759-55-4	1.500E+02 Y	W	3.0E-04	3.2E-11	2.5E-09	—
	Tb-160	013981-29-8	7.230E+01 D	W	3.0E-04	4.9E-11	5.1E-10	9.7E-05
	Thallium (81)	TI-202	015720-57-7	1.220E+01 D	D	1.0E+00	2.3E-11	1.6E-11
		TI-204	013968-51-9	3.780E+00 Y	D	1.0E+00	4.6E-11	3.5E-11
		TI-207 <sup>†</sup>	014133-67-6	4.770E+00 M	D	1.0E+00	3.5E-13	1.2E-13
		TI-208 <sup>†</sup>	014913-50-9	3.050E+00 M	D	1.0E+00	4.9E-13	1.4E-13
Thorium (90)	TI-209 <sup>†</sup>	015690-73-0	2.200E+00 M	D	1.0E+00	3.8E-13	1.2E-13	1.9E-04
	Th-227 <sup>†</sup>	015623-47-9	1.870E+01 D	Y	2.0E-04	1.2E-10	1.3E-07	4.3E-06
	Th-226 <sup>†</sup>	014274-82-9	1.910E+00 Y	Y	2.0E-04	3.0E-10	2.1E-06	1.5E-08
	Th-228+D	014274-82-9(+D)	1.910E+00 Y	Y	2.0E-04	1.5E-09	2.1E-06	1.5E-04

**Radionuclide Carcinogenicity From HEAST— Slope Factors<sup>a</sup>  
(In Units of Becquerels<sup>b</sup>)**

Element (Atomic Number)	Isotope <sup>c</sup>	CASRN <sup>d</sup>	Radioactive Half-Life <sup>e</sup>	ICRP Lung Class <sup>f</sup>	GI Absorption Factor ( $f_g$ ) <sup>g</sup>	Slope Factor Lifetime Excess Total Cancer Risk Per Unit Intake or Exposure		
						Ingestion (Risk/Bq)	Inhalation (Risk/Bq)	External Exposure (Risk/yr per Bq/g soil)
Thorium (90)	Th-229†	015594-54-4	7.340E+03 Y	Y	2.0E-04	5.7E-10	2.0E-06	—
	Th-229+D	015594-54-4(+D)	7.340E+03 Y	Y	2.0E-04	2.4E-09	2.1E-06	1.8E-05
	Th-230†	014269-63-7	7.700E+04 Y	Y	2.0E-04	3.5E-10	7.8E-07	1.5E-09
	Th-231†	014932-40-2	2.550E+01 H	Y	2.0E-04	1.1E-11	1.3E-11	6.2E-08
	Th-232†	007440-29-1	1.410E+10 Y	Y	2.0E-04	3.2E-10	7.6E-07	7.0E-10
	Th-234†	015065-10-8	2.410E+01 D	Y	2.0E-04	1.1E-10	8.6E-10	9.5E-08
Thulium (69)	Tm-170	013981-30-1	1.290E+02 D	W	3.0E-04	4.1E-11	5.7E-10	1.0E-07
	Tm-171	014333-45-0	1.920E+00 Y	W	3.0E-04	3.2E-12	8.4E-11	8.9E-09
Tin (50)	Sn-113	013966-06-8	1.150E+02 D	W	2.0E-02	2.4E-11	2.5E-10	8.9E-08
	Sn-121	014683-06-8	2.710E+01 H	W	2.0E-02	7.3E-12	8.6E-12	—
	Sn-121m	014683-06-8(m)	5.550E+01 Y	W	2.0E-02	1.5E-11	2.5E-10	—
	Sn-125	014683-06-0	9.640E+00 D	W	2.0E-02	9.7E-11	3.2E-10	3.0E-05
	Sn-126	015832-50-5	1.000E+05 Y	W	2.0E-02	1.5E-10	2.1E-09	8.9E-07
Tungsten (74)	W-181	015749-46-9	1.210E+02 D	D	3.0E-01	2.2E-12	1.7E-12	5.9E-07
	W-185	014932-41-3	7.510E+01 D	D	3.0E-01	1.3E-11	8.1E-12	1.3E-09

**Radionuclide Carcinogenicity From HEAST– Slope Factors<sup>a</sup>  
(In Units of Becquerels<sup>b</sup>)**

Element (Atomic Number)	Isotope <sup>c</sup>	CASRN <sup>d</sup>	Radioactive Half-Life <sup>e</sup>	ICRP Lung Class <sup>f</sup>	GI Absorption Factor ( $f_1$ ) <sup>g</sup>	Slope Factor Lifetime Excess Total Cancer Risk Per Unit Intake or Exposure		
						Ingestion (Risk/Bq)	Inhalation (Risk/Bq)	External Exposure (Risk/yr per Bq/g soft)
Uranium (92)	W-187	014983-48-3	2.380E+01 H	D	3.0E-01	1.7E-11	1.1E-11	4.1E-05
	U-232	014158-29-3	7.200E+01 Y	Y	5.0E-02	1.0E-09	1.6E-06	1.2E-09
	U-233	013968-55-3	1.590E+05 Y	Y	5.0E-02	4.3E-10	7.3E-07	1.1E-09
	U-234 <sup>†</sup>	013968-29-5	2.450E+05 Y	Y	5.0E-02	4.3E-10	7.0E-07	8.1E-10
	U-235 <sup>†</sup>	015117-96-1	7.040E+08 Y	Y	5.0E-02	4.3E-10	6.8E-07	6.8E-06
	U-235+D	015117-96-1(+D)	7.040E+08 Y	Y	5.0E-02	4.3E-10	6.8E-07	6.5E-06
	U-236	013982-70-2	2.340E+07 Y	Y	5.0E-02	4.1E-10	6.8E-07	6.5E-10
	U-237	014269-75-1	6.750E+00 D	Y	5.0E-02	2.4E-11	7.0E-11	3.5E-06
	U-238 <sup>†</sup>	007440-61-1	4.470E+09 Y	Y	5.0E-02	4.3E-10	6.5E-07	5.7E-10
	U-238+D	007440-61-1(+D)	4.470E+09 Y	Y	5.0E-02	5.4E-10	6.5E-07	1.4E-06
Vanadium (23)	U-240	015687-53-3	1.410E+01 H	Y	5.0E-02	3.2E-11	3.2E-11	4.1E-09
	V-48	014331-97-6	1.600E+01 D	W	1.0E-02	5.9E-11	2.1E-10	2.7E-04
Xenon (54)	Xe-122	015151-09-4	2.010E+01 H	*	1.0E+00	—	8.9E-14	2.3E-06
	Xe-123	015700-10-4	2.140E+00 H	*	1.0E+00	—	2.0E-14	4.6E-05
	Xe-125	013994-18-8	1.680E+01 H	*	1.0E+00	—	1.1E-14	1.3E-05

**Radionuclide Carcinogenicity From HEAST– Slope Factors<sup>a</sup>  
(In Units of Becquerels<sup>b</sup>)**

Element (Atomic Number)	Isotope <sup>c</sup>	CASRN <sup>d</sup>	Radioactive Half-life <sup>e</sup>	ICRP Lung Class <sup>f</sup>	GI Absorption Factor ( $f_1$ ) <sup>g</sup>	Slope Factor Lifetime Excess Total Cancer Risk Per Unit Intake or Exposure		
						Ingestion (Risk/Bq)	Inhalation (Risk/Bq)	External Exposure (Risk/yr per Bq/g soil)
	Xe-127	013994-19-9	3.640E+01 D	•	1.0E+00	—	1.1E-14	1.4E-05
	Xe-129m	013965-99-6(m)	8.890E+00 D	*	1.0E+00	—	1.6E-14	3.5E-07
	Xe-131m	014683-11-5(m)	1.180E+01 D	*	1.0E+00	—	1.2E-14	1.2E-07
	Xe-133	014932-42-4	5.250E+00 D	•	1.0E+00	—	1.2E-14	6.2E-07
	Xe-133m	014932-42-4(m)	2.190E+00 D	•	1.0E+00	—	1.5E-14	8.9E-07
	Xe-135	014995-62-1	9.110E+00 H	•	1.0E+00	—	2.2E-14	1.7E-05
	Xe-135m	014995-62-1(m)	1.540E+01 M	•	1.0E+00	—	5.7E-15	3.5E-05
	Xe-137	014835-21-3	3.830E+00 M	•	1.0E+00	—	4.9E-14	1.8E-05
	Xe-138	015751-81-2	1.410E+01 M	•	1.0E+00	—	7.6E-14	1.1E-04
Yttrium (39)	Y-90 <sup>†</sup>	010098-91-6	6.410E+01 H	Y	1.0E-04	8.6E-11	1.5E-10	0.0E+00
	Y-91	014234-24-3	5.850E+01 D	Y	1.0E-04	7.6E-11	1.3E-09	3.2E-07
	Y-91m	014234-24-3(m)	4.970E+01 M	Y	1.0E-04	5.9E-13	9.5E-13	4.6E-05
	Y-92	015751-59-4	3.540E+00 H	Y	1.0E-04	1.9E-11	1.6E-11	2.3E-05
	Y-93	014981-70-5	1.010E+01 H	Y	1.0E-04	3.8E-11	3.8E-11	8.1E-06
Zinc (30)	Zn-65	013982-39-3	2.440E+02 D	Y	5.0E-01	2.3E-10	4.3E-10	5.4E-05

## Radionuclide Carcinogenicity From HEAST— Slope Factors<sup>a</sup> (In Units of Becquerels<sup>b</sup>)

Element (Atomic Number)	Isotope <sup>c</sup>	CASRN <sup>d</sup>	Radioactive Half-life <sup>e</sup>	ICRP Lung Class <sup>f</sup>	GI Absorption Factor (f, <sub>1</sub> ) <sup>g</sup>	Slope Factor Lifetime Excess Total Cancer Risk Per Unit Intake or Exposure		
						Ingestion (Risk/Bq)	Inhalation (Risk/Bq)	External Exposure (Risk/yr per Bq/g soil)
Zirconium (40)	Zn-69	013982-23-5	5.580E+01 M	Y	5.0E-01	1.5E-12	8.6E-13	4.9E-10
	Zn-69m	013982-23-5(m)	1.380E+01 H	Y	5.0E-01	1.2E-11	1.5E-11	3.5E-05
	Zr-93	015751-77-6	1.530E+06 Y	W	2.0E-03	4.6E-12	1.8E-10	0.0E+00
	Zr-95	013967-71-0	6.400E+01 D	W	2.0E-03	2.7E-11	2.7E-10	6.8E-05
	Zr-87	014928-30-4	1.690E+01 H	W	2.0E-03	6.5E-11	6.8E-11	1.6E-05

<sup>a</sup> Calculated by the EPA Office of Radiation and Indoor Air; as presented in HEAST, Annual Update, FY1993 (March). EPA classifies all radionuclides as Group A carcinogens. Radionuclide slope factors are calculated to assist HEAST users with risk-related evaluations and decision-making at various stages of the remediation process. Ingestion and Inhalation slope factors are best estimates (i.e., median or 50th percentile values) of the age-averaged, lifetime excess cancer incidence (fatal and nonfatal cancer) risk per unit of activity inhaled or ingested, expressed as risk/becquerel (Bq). External exposure slope factors are best estimates of the lifetime excess cancer incidence risk for each year of exposure to external radiation from photon-emitting radionuclides distributed uniformly in a thick layer of soil, and are expressed as risk/yr per Bq/gram of soil.

<sup>b</sup> A becquerel (Bq), the SI unit of activity, is equal to one nuclear transformation per second. 1 Bq = 27 pCi.

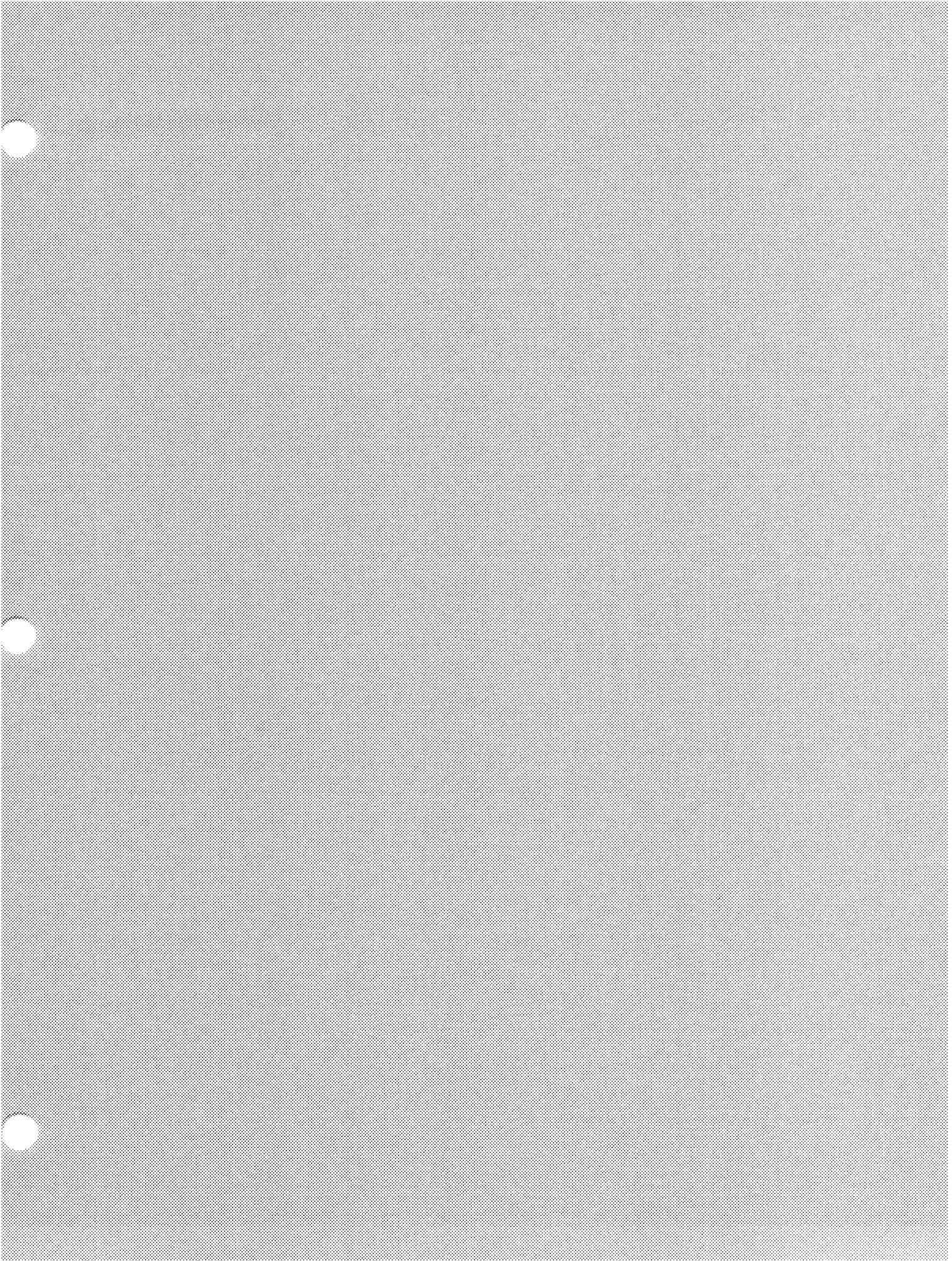
<sup>c</sup> For each radionuclide listed, corresponding slope factors are the risks per unit intake or exposure for that radionuclide only, except when marked with a "+D" to indicate that the risks from radioactive decay chain products are also included. Radionuclides designated with a "T" are members of a decay chain.

<sup>d</sup> Chemical Abstract Service Reference Number. For risk calculations involving decay chains, a CASRN should be reported for the parent radionuclide and each chain member.

<sup>e</sup> Radioactive half-life: S = Second, M = Minute, D = Day, Y = Year. For those radionuclides with decay products (+D), half-lives are listed for the parent radionuclide.

<sup>f</sup> Lung clearance classification recommended by the International Commission on Radiological Protection (ICRP); Y = Year, W = Week, D = Day, \* = Gas.

<sup>g</sup> GI absorption factors are the fractional amount of the radionuclide absorbed across the GI tract into the bloodstream. Lung clearance classifications and GI absorption values are provided for reference only. Do not use these factors to adjust (i.e., multiply or divide) Inhalation or Ingestion slope factors. See the User's Guide for instructions.



**DERMAL RISK VALUES DERIVED BY CALCULATION  
FROM GASTROINTESTINAL (GI) ABSORPTION DATA IN ALPHABETICAL ORDER**

Chemical	CAS Number	GI Absorption Factor (%) <sup>a</sup>	GI Absorption Reference	Oral RfD (mg/kg/day)		Oral Slope Factor (mg/kg/day) <sup>-1</sup>	Dermal RfD (mg/kg/day)		Dermal Slope Factor (mg/kg/day) <sup>-1</sup>
				Chronic	Subchronic		Chronic	Subchronic	
ACENAPHTHYLENE	000208-96-8	31	2	NA	NA	NA	NA	NA	NA
ACETONE	000067-64-1	83	3	1.00E-01 <sup>a</sup>	1.00E+00 <sup>b</sup>	NA	8.30E-02	8.30E-01	NA
ALUMINUM	007429-90-5	10	4,5	NA	NA	NA	NA	NA	NA
ANTHRACENE	000120-12-7	76	6	3.00E-01 <sup>a</sup>	3.00E+00 <sup>b</sup>	NA	2.28E-01	2.28E+00	NA
ANTIMONY (METALLIC)	007440-36-0	2.0	7	4.00E-04 <sup>a</sup>	4.00E-04 <sup>b</sup>	NA	8.00E-06	8.00E-06	NA
ARSENIC, INORGANIC	007440-38-2	41	8	3.00E-04 <sup>a</sup>	3.00E-04 <sup>b</sup>	NA	1.23E-04	1.23E-04	NA
BARIUM	007440-39-3	7.0	9	7.00E-02 <sup>a</sup>	7.00E-02 <sup>b</sup>	NA	4.90E-03	4.90E-03	NA
BENENE, TRIMETHYL	025551-13-7	97	10	NA	NA	NA	NA	NA	NA
BENZENE	000071-43-2	97	10	NA	NA	2.90E-02 <sup>a</sup>	NA	NA	2.99E-02
BENZENE HEXACHLORIDE	NA	97	10	NA	NA	NA	NA	NA	NA
BENZENE, ETHYLDIMETHYL	NA	97	10	NA	NA	NA	NA	NA	NA
BENZENE, ETHYLMETHYL	NA	97	10	NA	NA	NA	NA	NA	NA
BENZENE, METHYLPROPENYL	NA	97	10	NA	NA	NA	NA	NA	NA
BENZENE, METHYLPROPYL	NA	97	10	NA	NA	NA	NA	NA	NA
BENZIDINE	000092-87-5	80	11	3.00E-03 <sup>a</sup>	3.00E-03 <sup>b</sup>	2.30E+02 <sup>a</sup>	2.40E-03	2.40E-03	2.88E+02
BENZOIC ACID	000065-85-0	100	12	4.00E+00 <sup>a</sup>	4.00E+00 <sup>b</sup>	NA	4.00E+00	4.00E+00	NA
BENZO[A]PYRENE	000050-32-8	31	2	NA	NA	7.30E+00 <sup>a</sup>	NA	NA	2.35E+01
BENZO[B]FLUORANTHENE	000205-99-2	31	2	NA	NA <sup>e</sup>	NA	NA	NA	NA
BENZO[G,H,I]PERYLENE	000191-24-2	31	2	NA	NA	NA	NA	NA	NA
BENZO[K]FLUORANTHENE	000207-08-9	31	2	NA	NA	NA	NA	NA	NA
BENZYL ALCOHOL	000100-51-6	66	12	3.00E-01 <sup>b</sup>	1.00E+00 <sup>b</sup>	NA	1.98E-01	6.60E-01	NA
BERYLLIUM	007440-41-7	1.0	13, 14	5.00E-03 <sup>a</sup>	5.00E-03 <sup>b</sup>	4.30E+00 <sup>a</sup>	5.00E-05	5.00E-05	4.30E+02

**DERMAL RISK VALUES DERIVED BY CALCULATION  
FROM GASTROINTESTINAL (GI) ABSORPTION DATA IN ALPHABETICAL ORDER**

Chemical	CAS Number	GI Absorption Factor (%) <sup>a</sup>	GI Absorption Reference	Oral RfD (mg/kg/day)		Oral Slope Factor (mg/kg/day) <sup>-1</sup>	Dermal RfD (mg/kg/day)		Dermal Slope Factor (mg/kg/day) <sup>-1</sup>
				Chronic	Subchronic		Chronic	Subchronic	
BIS(2-ETHYLHEXYL)PHTHALATE	000117-81-7	19	15	2.00E-02 <sup>a</sup>	2.00E-02 <sup>b,e</sup>	1.40E-02 <sup>a</sup>	3.80E-03	3.80E-03	7.37E-02
BUTANONE-2, 4-CHLORO-4,4-DIFLUORO	NA	80	1	NA	NA	NA	NA	NA	NA
CADMIUM (Diet)	007440-43-9	1.0	16, 17, 18, 19	1.00E-03 <sup>b</sup>	NA	NA	1.00E-05	NA	NA
CARBON DISULFIDE	000075-15-0	63	20	1.00E-01 <sup>a</sup>	1.00E-01 <sup>b</sup>	NA	6.30E-02	6.30E-02	NA
CARBON TETRACHLORIDE	000056-23-5	65	21	7.00E-04 <sup>a</sup>	7.00E-03 <sup>b,e</sup>	1.30E-01 <sup>a</sup>	4.55E-04	4.55E-03	2.00E-01
CHLORDANE	000057-74-9	50	22	6.00E-05 <sup>a</sup>	6.00E-05 <sup>b,e</sup>	1.30E+00 <sup>a</sup>	3.00E-05	3.00E-05	2.60E+00
CHLOROBENZENE	000108-90-7	31	23	2.00E-02 <sup>a</sup>	2.00E-01 <sup>b,e</sup>	NA	6.20E-03	6.20E-02	NA
CHLOROFORM	000067-66-3	20	24	1.00E-02 <sup>a</sup>	1.00E-02 <sup>b,e</sup>	6.10E-03 <sup>a</sup>	2.00E-03	2.00E-03	3.05E-02
CHROMIUM (VI)	018540-29-9	2.0	25	5.00E-03 <sup>a</sup>	2.00E-02 <sup>b,e</sup>	NA	1.00E-04	4.00E-04	NA
CHRYSENE	000218-01-9	31	2	NA	NA	NA	NA	NA	NA
COBALT	007440-48-4	80	26	NA	NA	NA	NA	NA	NA
COPPER	007440-50-8	30	27	NA	NA <sup>f</sup>	NA	NA	NA	NA
DDT	000050-29-3	70	28	5.00E-04 <sup>a</sup>	5.00E-04 <sup>b</sup>	3.40E-01 <sup>a</sup>	3.50E-04	3.50E-04	4.86E-01
DIBUTYL PHTHALATE	000084-74-2	100	29	1.00E-01 <sup>a</sup>	1.00E+00 <sup>b</sup>	NA	1.00E-01	NA	NA
DICHLORODIFLUOROMETHANE	000075-71-8	23	12	2.00E-01 <sup>b</sup>	8.00E-01 <sup>b</sup>	NA	4.60E-02	2.07E-01	NA
DICHLOROETHANE, 1,2-	000107-06-2	100	30	NA	NA <sup>e</sup>	9.10E-02 <sup>a</sup>	NA	NA	9.10E-02
DICHLOROETHYLENE, 1,1-	000075-35-4	100	31	9.00E-03 <sup>a</sup>	9.00E-03 <sup>b</sup>	6.00E-01 <sup>a</sup>	9.00E-03	9.00E-03	6.00E-01
DINITRO-O-CRESOL, 4,6-	000534-52-1	100	12	NA	NA	NA	NA	NA	NA
DINITROBENZENE, 1,2-	000528-29-0	93	32	4.00E-04 <sup>b</sup>	4.00E-03 <sup>b</sup>	NA	3.72E-04	3.72E-03	NA
DINITROTOLUENE, 2,4-	000121-14-2	85	33	2.00E-03 <sup>a</sup>	2.00E-03 <sup>b</sup>	6.80E-01 <sup>a,g</sup>	1.70E-03	1.70E-03	8.00E-01
DINITROTOLUENE, 2,6-	000606-20-2	85	33	1.00E-03 <sup>b</sup>	1.00E-02 <sup>b</sup>	6.80E-01 <sup>a,g</sup>	8.50E-04	8.50E-03	8.00E-01
ETHYLBENZENE	000100-41-4	97	10	1.00E-01 <sup>a</sup>	NA <sup>e</sup>	NA	9.70E-02	NA	NA

**DERMAL RISK VALUES DERIVED BY CALCULATION  
FROM GASTROINTESTINAL (GI) ABSORPTION DATA IN ALPHABETICAL ORDER**

Chemical	CAS Number	GI Absorption Factor (%) <sup>a</sup>	GI Absorption Reference	Oral RfD (mg/kg/day)		Oral Slope Factor (mg/kg/day) <sup>-1</sup>	Dermal RfD (mg/kg/day)		Dermal Slope Factor (mg/kg/day) <sup>-1</sup>
				Chronic	Subchronic		Chronic	Subchronic	
FLUORANTHENE	000206-44-0	31	2	4.00E-02 <sup>a</sup>	4.00E-01 <sup>b</sup>	NA	1.24E-02	1.24E-01	NA
FLUORIDE	007782-41-4	97	34	6.00E-02 <sup>a</sup>	6.00E-02 <sup>b</sup>	NA	5.82E-02	5.82E-02	NA
HEPTACHLOR	000076-44-8	72	35	5.00E-04 <sup>a</sup>	5.00E-04 <sup>b</sup>	4.50E+00 <sup>a</sup>	3.60E-04	3.60E-04	6.25E+00
HEPTACHLOR EPOXIDE	001024-57-3	72	35	1.30E-05 <sup>a</sup>	1.30E-05 <sup>b</sup>	9.10E+00 <sup>a</sup>	9.36E-06	9.36E-06	1.26E+01
HEXACHLOROCYCLOHEXANE, GAMMA-	000058-89-9	97	10	3.00E-04 <sup>a</sup>	3.00E-03 <sup>b</sup>	1.30E+00 <sup>b</sup>	2.91E-04	2.91E-03	1.34E+00
HEXANONE, 2-	000591-78-6	66	36	NA	NA	NA	NA	NA	NA
HYDROGEN CYANIDE	000074-90-8	17	37	2.00E-02 <sup>a</sup>	NA	NA	3.40E-03	NA	NA
INDENO[1,2,3-cd]PYRENE	000193-39-5	31	2	NA	NA	NA	NA	NA	NA
IRON	007439-89-6	15	26	NA	NA	NA	NA	NA	NA
ISOPROPANOL	000067-63-0	100	12	NA	NA	NA	NA	NA	NA
LEAD AND COMPOUNDS	007439-92-1	15	26	NA	NA	NA	NA	NA	NA
LITHIUM	007439-93-2	80	26	NA	NA	NA	NA	NA	NA
MAGNESIUM	007439-95-4	20	26	NA	NA	NA	NA	NA	NA
MANGANESE (Water)	007439-96-5	4.0	38	5.00E-03 <sup>a</sup>	5.00E-03 <sup>b</sup>	NA	2.00E-04	2.00E-04	NA
MERCURY, INORGANIC	007439-97-6	0.01	26, 39	3.00E-04 <sup>b</sup>	3.00E-04 <sup>b</sup>	NA	3.00E-08	3.00E-08	NA
METHYL ETHYL KETONE	000078-93-3	80	1	6.00E-01 <sup>a</sup>	2.00E+00 <sup>b</sup>	NA	4.80E-01	1.60E+00	NA
METHYL MERCURY	022967-82-6	90	26, 39, 40	3.00E-04 <sup>a</sup>	3.00E-04 <sup>b</sup>	NA	2.70E-04	2.70E-04	NA
METHYLENE CHLORIDE	000075-09-2	95	41	6.00E-02 <sup>a</sup>	6.00E-02 <sup>b</sup>	7.50E-03 <sup>a</sup>	5.70E-02	5.70E-02	7.89E-03
MOLYBDENUM	007439-98-7	38	42	5.00E-03 <sup>a</sup>	5.00E-03 <sup>b</sup>	NA	1.90E-03	1.90E-03	NA
NAPHTHALENE	000091-20-3	80	43	NA <sup>c</sup>	NA <sup>c</sup>	NA	NA	NA	NA
NAPHTHALENE, 1-METHYL	000090-12-0	80	43	NA	NA	NA	NA	NA	NA
NAPHTHALENE, 2-METHYL	000091-57-6	80	43	NA	NA	NA	NA	NA	NA

**DERMAL RISK VALUES DERIVED BY CALCULATION  
FROM GASTROINTESTINAL (GI) ABSORPTION DATA IN ALPHABETICAL ORDER**

Chemical	CAS Number	GI Absorption Factor (%) <sup>a</sup>	GI Absorption Reference	Oral RfD (mg/kg/day)		Oral Slope Factor (mg/kg/day) <sup>-1</sup>	Dermal RfD (mg/kg/day)		Dermal Slope Factor (mg/kg/day) <sup>-1</sup>
				Chronic	Subchronic		Chronic	Subchronic	
NICKEL SOLUBLE SALTS	007440-02-0	27	44	2.00E-02 <sup>a</sup>	2.00E-02 <sup>b</sup>	NA	5.40E-03	5.40E-03	NA
NITROBENZENE	000098-95-3	97	10	5.00E-04 <sup>a</sup>	5.00E-03 <sup>b</sup>	NA	4.85E-04	4.85E-03	NA
NITROPHENOL, 4-	000100-02-7	100	12	NA	NA	NA	NA	NA	NA
NITROSO-DI-N-PROPYLAMINE, N-	000621-64-7	25	45	NA	NA	7.00E+00 <sup>a</sup>	NA	NA	2.80E+01
NITROSODIPHENYLAMINE, N-	000086-30-6	25	45	NA	NA	4.90E-03 <sup>a</sup>	NA	NA	1.96E-02
PENTYL ALCOHOL, N-	000071-41-0	50	12	NA	NA	NA	NA	NA	NA
PHENANTHRENE	000085-01-8	73	2	NA	NA	NA	NA	NA	NA
PHENOL	000108-95-2	90	12	6.00E-01 <sup>a</sup>	6.00E-01 <sup>b</sup>	NA	5.40E-01	5.40E-01	NA
POLYCHLORINATED BIPHENYLS	001336-36-3	90	46	NA	NA	7.70E+00 <sup>a</sup>	NA	NA	8.56E+00
PYRENE	000129-00-0	31	2	3.00E-02 <sup>a</sup>	3.00E-01 <sup>b</sup>	NA	9.30E-03	9.30E-02	NA
SELENIOUS ACID	007783-00-8	87	47	5.00E-03 <sup>a</sup>	6.00E-03 <sup>b</sup>	NA	4.35E-03	4.35E-03	NA
SELENITE	014124-67-6	70	48	NA	NA	NA	NA	NA	NA
SELENIUM	007782-49-2	44	47	5.00E-03 <sup>a</sup>	5.00E-03 <sup>b</sup>	NA	2.20E-03	2.20E-03	NA
SILVER	007440-22-4	18	49	5.00E-03 <sup>a</sup>	5.00E-03 <sup>b</sup>	NA	9.00E-04	9.00E-04	NA
SULFATE	014808-79-8	20	50	NA	NA	NA	NA	NA	NA
TETRACHLOROETHANE, 1,1,2,2-	000079-34-5	70	51	NA	NA	2.00E-01 <sup>a</sup>	NA	NA	2.86E-01
THALLIUM	007440-28-0	15	52	NA	NA	NA	NA	NA	NA
THORIUM	007440-29-1	1.0	53	NA	NA	NA	NA	NA	NA
TIN	007440-31-5	10	26	6.00E-01 <sup>b</sup>	6.00E-01 <sup>b</sup>	NA	6.00E-02	6.00E-02	NA
TITANIUM	007440-32-6	3.0	26	NA <sup>e</sup>	NA <sup>e</sup>	NA	NA	NA	NA
TOLUENE	000108-88-3	80	54	2.00E-01 <sup>a</sup>	2.00E+00 <sup>b</sup>	NA	1.60E-01	1.60E+00	NA
TRICHLOROETHANE, 1,1,1-	000071-55-6	90	55	NA <sup>e</sup>	NA <sup>e</sup>	NA	NA	NA	NA

**DERMAL RISK VALUES DERIVED BY CALCULATION  
FROM GASTROINTESTINAL (GI) ABSORPTION DATA IN ALPHABETICAL ORDER**

Chemical	CAS Number	GI Absorption Factor (%) <sup>a</sup>	GI Absorption Reference	Oral RfD (mg/kg/day)		Oral Slope Factor (mg/kg/day) <sup>-1</sup>	Dermal RfD (mg/kg/day)		Dermal Slope Factor (mg/kg/day) <sup>-1</sup>
				Chronic	Subchronic		Chronic	Subchronic	
TRICHLOROETHANE, 1,1,2-	000079-00-5	81	56	4.00E-03 <sup>b</sup>	4.00E-02 <sup>b</sup>	5.70E-02 <sup>b</sup>	3.24E-03	3.24E-02	7.04E-02
TRICHLOROETHYLENE	000079-01-6	15	57	NA	NA	NA <sup>c</sup>	NA	NA	NA
TRICHLOROFLUOROMETHANE	000075-69-4	23	12	3.00E-01 <sup>a</sup>	7.00E-01 <sup>b</sup>	NA	6.90E-02	1.61E-01	NA
URANIUM	007440-61-1	85	26	NA	NA	NA	NA	NA	NA
VANADIUM, METALLIC	007440-62-2	1.0	58, 59	7.00E-03 <sup>b</sup>	7.00E-03 <sup>b</sup>	NA	7.00E-05	7.00E-05	NA
VINYL ACETATE	000108-05-4	65	60	1.00E+00 <sup>b</sup>	1.00E+00 <sup>b</sup>	NA	6.50E-01	6.50E-01	NA
XYLENE, MIXTURE	001330-20-7	92	61	2.00E+00 <sup>a</sup>	NA <sup>c</sup>	NA	1.84E+00	NA	NA
ZINC (METALLIC)	007440-66-6	20	62	3.00E-01 <sup>a</sup>	3.00E-01 <sup>b</sup>	NA	6.00E-02	6.00E-02	NA
ZIRCONIUM	007440-67-7	80	12	NA	NA	NA	NA	NA	NA

<sup>a</sup> GI absorption factors obtained from literature by BEIA staff

<sup>b</sup> Source: Integrated Risk Information System (IRIS)

<sup>c</sup> Source: Health Effects Assessment Summary Table (HEAST) FY1994 and July Supplement

<sup>d</sup> Listed as "Dinitrotoluene mixture, 2,4-/2,6-" in IRIS. The value is based on a study using technical grade DNT.

**DERMAL RISK VALUES DERIVED BY CALCULATION  
FROM GASTROINTESTINAL (GI) ABSORPTION DATA IN CAS NUMBER ORDER**

CAS Number	Chemical	GI Absorption Factor (%) <sup>a</sup>	GI Absorption Reference	Oral RfD (mg/kg/day)		Oral Slope Factor (mg/kg/day) <sup>-1</sup>	Dermal RfD (mg/kg/day)		Dermal Slope Factor (mg/kg/day) <sup>-1</sup>
				Chronic	Subchronic		Chronic	Subchronic	
NA	BENZENE HEXACHLORIDE	97	10	NA	NA	NA	NA	NA	NA
NA	BENZENE, ETHYLDIMETHYL	97	10	NA	NA	NA	NA	NA	NA
NA	BENZENE, ETHYLMETHYL	97	10	NA	NA	NA	NA	NA	NA
NA	BENZENE, METHYLPROPENYL	97	10	NA	NA	NA	NA	NA	NA
NA	BENZENE, Methylpropyl	97	10	NA	NA	NA	NA	NA	NA
NA	BUTANONE-2, 4-CHLORO-4,4-DIFLUORO	80	1	NA	NA	NA	NA	NA	NA
000050-29-3	DDT	70	28	5.00E-04 <sup>b</sup>	5.00E-04 <sup>c</sup>	3.40E-01 <sup>b</sup>	3.50E-04	3.50E-04	4.86E-01
000050-32-8	BENZO[A]PYRENE	31	2	NA	NA	7.30E+00 <sup>b</sup>	NA	NA	2.35E+01
000056-23-5	CARBON TETRACHLORIDE	65	21	7.00E-04 <sup>b</sup>	7.00E-03	1.30E-01 <sup>b</sup>	4.55E-04	4.55E-03	2.00E-01
000057-74-9	CHLORDANE	50	22	6.00E-05 <sup>b</sup>	6.00E-05	1.30E+00 <sup>b</sup>	3.00E-05	3.00E-05	2.80E+00
000058-89-9	HEXACHLOROCYCLOHEXANE, GAMMA-	97	10	3.00E-04 <sup>b</sup>	3.00E-03 <sup>c</sup>	1.30E+00	2.91E-04	2.91E-03	1.34E+00
000065-85-0	BENZOIC ACID	100	12	4.00E+00 <sup>b</sup>	4.00E+00 <sup>c</sup>	NA	4.00E+00	4.00E+00	NA
000067-63-0	ISOPROPANOL	100	12	NA	NA	NA	NA	NA	NA
000067-64-1	ACETONE	83	3	1.00E-01 <sup>b</sup>	1.00E+00 <sup>c</sup>	NA	8.30E-02	8.30E-01	NA
000067-66-3	CHLOROFORM	20	24	1.00E-02 <sup>b</sup>	1.00E-02	6.10E-03 <sup>b</sup>	2.00E-03	2.00E-03	3.05E-02
000071-41-0	PENTYL ALCOHOL, N-	50	12	NA	NA	NA	NA	NA	NA
000071-43-2	BENZENE	97	10	NA	NA	2.90E-02 <sup>b</sup>	NA	NA	2.99E-02
000071-55-6	TRICHLOROETHANE, 1,1,1-	90	55	NA	NA	NA	NA	NA	NA
000074-90-8	HYDROGEN CYANIDE	17	37	2.00E-02 <sup>b</sup>	NA	NA	3.40E-03	NA	NA
000075-09-2	METHYLENE CHLORIDE	95	41	6.00E-02 <sup>b</sup>	6.00E-02 <sup>c</sup>	7.50E-03 <sup>b</sup>	5.70E-02	5.70E-02	7.89E-03
000075-15-0	CARBON DISULFIDE	63	20	1.00E-01 <sup>b</sup>	1.00E-01 <sup>c</sup>	NA	6.30E-02	6.30E-02	NA
000075-35-4	DICHLOROETHYLENE, 1,1-	100	31	9.00E-03 <sup>b</sup>	9.00E-03 <sup>c</sup>	6.00E-01 <sup>b</sup>	9.00E-03	9.00E-03	6.00E-01

**DERMAL RISK VALUES DERIVED BY CALCULATION  
FROM GASTROINTESTINAL (GI) ABSORPTION DATA IN CAS NUMBER ORDER**

CAS Number	Chemical	GI Absorption Factor (%) <sup>a</sup>	GI Absorption Reference	Oral RfD (mg/kg/day)		Oral Slope Factor (mg/kg/day) <sup>-1</sup>	Dermal RfD (mg/kg/day)		Dermal Slope Factor (mg/kg/day) <sup>-1</sup>
				Chronic	Subchronic		Chronic	Subchronic	
000075-69-4	TRICHLOROFLUOROMETHANE	23	12	3.00E-01 <sup>b</sup>	7.00E-01 <sup>c</sup>	NA	6.90E-02	1.61E-01	NA
000075-71-8	DICHLORODIFLUOROMETHANE	23	12	2.00E-01 <sup>c</sup>	9.00E-01 <sup>c</sup>	NA	4.60E-02	2.07E-01	NA
000076-44-8	HEPTACHLOR	72	35	5.00E-04 <sup>b</sup>	5.00E-04 <sup>c</sup>	4.50E+00 <sup>b</sup>	3.60E-04	3.60E-04	6.25E+00
000078-93-3	METHYL ETHYL KETONE	80	1	6.00E-01 <sup>b</sup>	2.00E+00 <sup>c</sup>	NA	4.80E-01	1.60E+00	NA
000079-00-5	TRICHLOROETHANE, 1,1,2-	81	56	4.00E-03 <sup>b</sup>	4.00E-02 <sup>c</sup>	5.70E-02 <sup>b</sup>	3.24E-03	3.24E-02	7.04E-02
000079-01-6	TRICHLOROETHYLENE	15	57	NA	NA	NA	NA	NA	NA
000079-34-5	TETRACHLOROETHANE, 1,1,2,2-	70	51	NA	NA	2.00E-01 <sup>b</sup>	NA	NA	2.86E-01
000084-74-2	DIBUTYL PHTHALATE	100	29	1.00E-01 <sup>b</sup>	1.00E+00 <sup>c</sup>	NA	1.00E-01	NA	NA
000085-01-8	PHENANTHRENE	73	2	NA	NA	NA	NA	NA	NA
000086-30-8	NITROSODIPHENYLAMINE, N-	25	45	NA	NA	4.90E-03 <sup>b</sup>	NA	NA	1.96E-02
000090-12-0	NAPHTHALENE, 1-METHYL	80	43	NA	NA	NA	NA	NA	NA
000091-20-3	NAPHTHALENE	80	43	NA	NA	NA	NA	NA	NA
000091-57-6	NAPHTHALENE, 2-METHYL	80	43	NA	NA	NA	NA	NA	NA
000092-87-5	BENZIDINE	80	11	3.00E-03 <sup>b</sup>	3.00E-03 <sup>c</sup>	2.30E+02 <sup>b</sup>	2.40E-03	2.40E-03	2.88E+02
000098-95-3	NITROBENZENE	97	10	5.00E-04 <sup>b</sup>	5.00E-03 <sup>c</sup>	NA	4.85E-04	4.85E-03	NA
000100-02-7	NITROPHENOL, 4-	100	12	NA	NA	NA	NA	NA	NA
000100-41-4	ETHYLBENZENE	97	10	1.00E-01 <sup>b</sup>	NA	NA	9.70E-02	NA	NA
000100-51-6	BENZYL ALCOHOL	66	12	3.00E-01 <sup>c</sup>	1.00E+00 <sup>c</sup>	NA	1.98E-01	6.60E-01	NA
000107-06-2	DICHLOROETHANE, 1,2-	100	30	NA	NA	9.10E-02 <sup>b</sup>	NA	NA	9.10E-02
000108-05-4	VINYL ACETATE	65	60	1.00E+00 <sup>c</sup>	1.00E+00 <sup>c</sup>	NA	6.50E-01	6.50E-01	NA
000108-88-3	TOLUENE	80	54	2.00E-01 <sup>b</sup>	2.00E+00 <sup>c</sup>	NA	1.60E-01	1.60E+00	NA
000108-90-7	CHLOROBENZENE	31	23	2.00E-02 <sup>b</sup>	2.00E-01	NA	6.20E-03	6.20E-02	NA

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				Chronic	Subchronic		Chronic	Subchronic	
000108-95-2	PHENOL	90	12	6.00E-01 <sup>b</sup>	6.00E-01 <sup>c</sup>	NA	5.40E-01	5.40E-01	NA
000117-81-7	BIS(2-ETHYLHEXYL)PHTHALATE	19	15	2.00E-02 <sup>b</sup>	2.00E-02	1.40E-02 <sup>b</sup>	3.80E-03	3.80E-03	7.37E-02
000120-12-7	ANTHRAACENE	76	6	3.00E-01 <sup>b</sup>	3.00E+00 <sup>c</sup>	NA	2.28E-01	2.28E+00	NA
000121-14-2	DINITROTOLUENE, 2,4-	85	33	2.00E-03 <sup>b</sup>	2.00E-03 <sup>c</sup>	6.80E-01 <sup>b,d</sup>	1.70E-03	1.70E-03	8.00E-01
000129-00-0	PYRENE	31	2	3.00E-02 <sup>b</sup>	3.00E-01 <sup>c</sup>	NA	9.30E-03	9.30E-02	NA
000191-24-2	BENZO[G,H,I]PERYLENE	31	2	NA	NA	NA	NA	NA	NA
000193-39-5	INDENO[1,2,3-cd]PYRENE	31	2	NA	NA	NA	NA	NA	NA
000205-99-2	BENZO[B]FLUORANTHENE	31	2	NA	NA	NA	NA	NA	NA
000206-44-0	FLUORANTHENE	31	2	4.00E-02 <sup>b</sup>	4.00E-01 <sup>c</sup>	NA	1.24E-02	1.24E-01	NA
000207-08-9	BENZO[K]FLUORANTHENE	31	2	NA	NA	NA	NA	NA	NA
000208-96-8	ACENAPHTHYLENE	31	2	NA	NA	NA	NA	NA	NA
000218-01-9	CHRYSENE	31	2	NA	NA	NA	NA	NA	NA
000528-29-0	DINITROBENZENE, 1,2-	93	32	4.00E-04 <sup>c</sup>	4.00E-03 <sup>c</sup>	NA	3.72E-04	3.72E-03	NA
000634-52-1	DINITRO-O-CRESOL, 4,6-	100	12	NA	NA	NA	NA	NA	NA
000591-78-6	HEXANONE, 2-	66	36	NA	NA	NA	NA	NA	NA
000606-20-2	DINITROTOLUENE, 2,6-	85	33	1.00E-03 <sup>c</sup>	1.00E-02 <sup>c</sup>	6.80E-01 <sup>b,d</sup>	8.50E-04	8.50E-03	8.00E-01
000621-64-7	NITROSO-DI-N-PROPYLAMINE, N-	25	45	NA	NA	7.00E+00 <sup>b</sup>	NA	NA	2.80E+01
001024-57-3	HEPTACHLOR EPOXIDE	72	35	1.30E-05 <sup>b</sup>	1.30E-05 <sup>c</sup>	9.10E+00 <sup>b</sup>	9.36E-06	9.36E-06	1.26E+01
001330-20-7	XYLENE, MIXTURE	92	61	2.00E+00 <sup>b</sup>	NA	NA	1.84E+00	NA	NA
001336-36-3	POLYCHLORINATED BIPHENYLS	90	46	NA	NA	7.70E+00 <sup>b</sup>	NA	NA	8.56E+00
007429-90-5	ALUMINUM	10	4,5	NA	NA	NA	NA	NA	NA
007439-89-6	IRON	15	26	NA	NA	NA	NA	NA	NA

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				Chronic	Subchronic		Chronic	Subchronic	
007439-92-1	LEAD AND COMPOUNDS	15	26	NA	NA	NA	NA	NA	NA
007439-93-2	LITHIUM	80	26	NA	NA	NA	NA	NA	NA
007439-95-4	MAGNESIUM	20	26	NA	NA	NA	NA	NA	NA
007439-96-5	MANGANESE (Water)	4.0	38	5.00E-03 <sup>b</sup>	5.00E-03 <sup>c</sup>	NA	2.00E-04	2.00E-04	NA
007439-96-5	MANGANESE (Water)	4.0	38	5.00E-03 <sup>b</sup>	5.00E-03 <sup>c</sup>	NA	2.00E-04	2.00E-04	NA
007439-97-6	MERCURY, INORGANIC	0.01	26, 39	3.00E-04 <sup>c</sup>	3.00E-04 <sup>c</sup>	NA	3.00E-08	3.00E-08	NA
007439-98-7	MOLYBDENUM	38	42	5.00E-03 <sup>b</sup>	5.00E-03 <sup>c</sup>	NA	1.90E-03	1.90E-03	NA
007440-02-0	NICKEL SOLUBLE SALTS	27	44	2.00E-02 <sup>b</sup>	2.00E-02 <sup>c</sup>	NA	5.40E-03	5.40E-03	NA
007440-22-4	SILVER	18	49	5.00E-03 <sup>b</sup>	5.00E-03 <sup>c</sup>	NA	9.00E-04	9.00E-04	NA
007440-28-0	THALLIUM	15	52	NA	NA	NA	NA	NA	NA
007440-29-1	THORIUM	1.0	53	NA	NA	NA	NA	NA	NA
007440-31-5	TIN	10	26	6.00E-01 <sup>c</sup>	6.00E-01 <sup>c</sup>	NA	6.00E-02	6.00E-02	NA
007440-32-6	TITANIUM	3.0	26	NA	NA	NA	NA	NA	NA
007440-36-0	ANTIMONY (METALLIC)	2.0	7	4.00E-04 <sup>b</sup>	4.00E-04 <sup>c</sup>	NA	8.00E-06	8.00E-06	NA
007440-38-2	ARSENIC, INORGANIC	41	8	3.00E-04 <sup>b</sup>	3.00E-04 <sup>c</sup>	NA	1.23E-04	1.23E-04	NA
007440-39-3	BARIUM	7.0	9	7.00E-02 <sup>b</sup>	7.00E-02 <sup>c</sup>	NA	4.90E-03	4.90E-03	NA
007440-41-7	BERYLLIUM	1.0	13, 14	5.00E-03 <sup>b</sup>	5.00E-03 <sup>c</sup>	4.30E+00 <sup>b</sup>	5.00E-05	5.00E-05	4.30E+02
007440-43-9	CADMUM (Diet)	1.0	16, 17, 18, 19	1.00E-03 <sup>b</sup>	NA	NA	1.00E-05	NA	NA
007440-43-9	CADMUM (Diet)	1.0	16, 17, 18, 19	1.00E-03 <sup>b</sup>	NA	NA	1.00E-05	NA	NA
007440-48-4	COBALT	80	26	NA	NA	NA	NA	NA	NA
007440-50-8	COPPER	30	27	NA	NA	NA	NA	NA	NA
007440-61-1	URANIUM	85	26	NA	NA	NA	NA	NA	NA

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				Chronic	Subchronic		Chronic	Subchronic	
007440-62-2	VANADIUM, METALLIC	1.0	58, 59	7.00E-03 <sup>c</sup>	7.00E-03 <sup>c</sup>	NA	7.00E-05	7.00E-05	NA
007440-66-6	ZINC (METALLIC)	20	62	3.00E-01 <sup>b</sup>	3.00E-01 <sup>c</sup>	NA	6.00E-02	6.00E-02	NA
007440-67-7	ZIRCONIUM	80	12	NA	NA	NA	NA	NA	NA
007782-41-4	FLUORIDE	97	34	6.00E-02 <sup>b</sup>	6.00E-02 <sup>c</sup>	NA	5.82E-02	5.82E-02	NA
007782-49-2	SELENIUM	44	47	5.00E-03 <sup>b</sup>	5.00E-03 <sup>c</sup>	NA	2.20E-03	2.20E-03	NA
007783-00-8	SELENIOUS ACID	87	47	5.00E-03 <sup>b</sup>	5.00E-03 <sup>c</sup>	NA	4.35E-03	4.35E-03	NA
014124-67-5	SELENITE	70	48	NA	NA	NA	NA	NA	NA
014808-79-8	SULFATE	20	50	NA	NA	NA	NA	NA	NA
018540-29-9	CHROMIUM (VI)	2.0	25	5.00E-03 <sup>b</sup>	2.00E-02	NA	1.00E-04	4.00E-04	NA
022967-92-6	METHYL MERCURY	90	26, 39, 40	3.00E-04 <sup>b</sup>	3.00E-04 <sup>c</sup>	NA	2.70E-04	2.70E-04	NA
025551-13-7	BENENE, TRIMETHYL	97	10	NA	NA	NA	NA	NA	NA

<sup>a</sup> GI absorption factors obtained from literature by BEIA staff

<sup>b</sup> Source: Integrated Risk Information System (IRIS)

<sup>c</sup> Source: Health Effects Assessment Summary Table (HEAST) FY1994 and July Supplement

<sup>d</sup> Listed as "Dinitrotoluene mixture, 2,4-/2,6-" in IRIS. The value is based on a study using technical grade DNT.

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Reference Number	Reference
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