**Section 742.APPENDIX B Tier 1 Illustrations and Tables <br>Section 742.ILLUSTRATION A Tier 1 Evaluation<br>Section 742.TABLE A Tier 1 Soil Remediation Objectivesa for Residential Properties**

**Section 742.ILLUSTRATION A Tier 1 Evaluation**



(Source: Amended at 31 Ill. Reg. 4063, effective February 23, 2007)

**Section 742.APPENDIX B Tier 1 Illustrations and Tables**

**Section 742.TABLE A Tier 1 Soil Remediation Objectivesa for Residential Properties**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | | Exposure Route-Specific Values for Soils | | Soil Component of the Groundwater Ingestion Exposure Route Values | |  |
| CAS No. | Chemical Name | Ingestion  (mg/kg) | Inhalation  (mg/kg) | Class I  (mg/kg) | Class II  (mg/kg) | ADL  (mg/kg) |
| 83-32-9 | Acenaphthene | 4,700b | ---c | 570b | 2,900 | \* |
| 67-64-1 | Acetone | 70,000b | 100,000d | 25b | 25 | \* |
| 15972-60-8 | Alachloro | 8e | ---c | 0.04 | 0.2 | NA |
| 116-06-3 | Aldicarbo | 78b | ---c | 0.013 | 0.07 | NA |
| 309-00-2 | Aldrin | 0.04e | 3e | 0.5e | 2.5 | 0.94 |
| 120-12-7 | Anthracene | 23,000b | ---c | 12,000b | 59,000 | \* |
| 1912-24-9 | Atrazineo | 2700b | ---c | 0.066 | 0.33 | NA |
| 71-43-2 | Benzene | 12e | 0.8e | 0.03 | 0.17 | \* |
| 56-55-3 | Benzo(*a*)anthracene | 0.9e,w | ---c | 2 | 8 | \* |
| 205-99-2 | Benzo(*b*)fluoranthene | 0.9e,w | ---c | 5 | 25 | \* |
| 207-08-9 | Benzo(*k*)fluroanthene | 9e | ---c | 49 | 250 | \* |
| 50-32-8 | Benzo(*a*)pyrene | 0.09,w | ---c | 8 | 82 | \* |
| 111-44-4 | Bis(2-chloroethyl)ether | 0.6e | 0.2e | 0.0004e | 0.0004 | 0.66 |
| 117-81-7 | Bis(2-ethylhexyl)phthalate | 46e | 31,000d | 3,600 | 31,000d | \* |
| 75-27-4 | Bromodichloromethane (Dichlorobromomethane) | 10e | 3,000d | 0.6 | 0.6 | \* |
| 75-25-2 | Bromoform | 81e | 53e | 0.8 | 0.8 | \* |
| 71-36-3 | Butanol | 7,800b | 10,000d | 17b | 17 | NA |
| 85-68-7 | Butyl benzyl phthalate | 16,000b | 930d | 930d | 930d | \* |
| 86-74-8 | Carbazole | 32e | ---c | 0.6e | 2.8 | NA |
| 1563-66-2 | Carbofurano | 390b | ---c | 0.22 | 1.1 | NA |
| 75-15-0 | Carbon disulfide | 7,800b | 720d,x | 32b | 160 | \* |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | |  | | Soil Component of the Groundwater Ingestion Exposure Route Values | | | |  |
| CAS No. | Chemical Name | Ingestion  (mg/kg) | Inhalation  (mg/kg) | | Class I  (mg/kg) | Class II  (mg/kg) | ADL  (mg/kg) | |
| 56-23-5 | Carbon tetrachloride | 5e | 0.3e | | 0.07 | 0.33 | \* | |
| 57-74-9 | Chlordane | 1.8 e | 72 e | | 10 | 48 | \* | |
| 106-47-8 | 4-Chloroaniline  (*p*-Chloroanaline) | 310b | ---c | | 0.7b | 0.7 | \* | |
| 108-90-7 | Chlorobenzene (Monochlorobenzene) | 1,600b | 130b | | 1 | 6.5 | \* | |
| 124-48-1 | Chlorodibromomethane (Dibromochloromethane) | 1,600b | 1,300d | | 0.4 | 0.4 | \* | |
| 67-66-3 | Chloroform | 100e | 0.3e | | 0.6 | 2.9 | \* | |
| 218-01-9 | Chrysene | 88e | ---c | | 160 | 800 | \* | |
| 94-75-7 | 2,4-Do | 780b | ---c | | 1.5 | 7.7 | \* | |
| 75-99-0 | Dalapono | 2,300b | ---c | | 0.85 | 8.5 | \* | |
| 72-54-8 | DDD | 3e | ---c | | 16e | 80 | \* | |
| 72-55-9 | DDE | 2e | ---c | | 54e | 270 | \* | |
| 50-29-3 | DDT | 2e | ---g | | 32e | 160 | \* | |
| 53-70-3 | Dibenzo(*a,h*)anthracene | 0.09e,f | ---c | | 2 | 7.6 | \* | |
| 96-12-8 | 1,2-Dibromo-3-chloropropane | 0.46e | 11b | | 0.002 | 0.002 | \* | |
| 106-93-4 | 1,2-Dibromoethane  (Ethylene dibromide) | 0.0075e | 0.17e | | 0.0004 | 0.004 | 0.005 | |
| 84-74-2 | Di-*n*-butyl phthalate | 7,800b | 2,300d | | 2,300d | 2,300d | \* | |
| 95-50-1 | 1,2-Dichlorobenzene  (*o* - Dichlorobenzene) | 7,000b | 560d | | 17 | 43 | \* | |
| 106-46-7 | 1,4-Dichlorobenzene  (*p* - Dichlorobenzene) | ---c | 11,000b | | 2 | 11 | \* | |
| 91-94-1 | 3,3'-Dichlorobenzidine | 1e | ---c | | 0.007e,f | 0.033 | 1.3 | |
| 75-34-3 | 1,1-Dichloroethane | 7,800b | 1,300b | | 23b | 110 | \* | |

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| --- | --- | --- | --- | --- | --- | --- | --- |
|  | | Exposure Route-Specific Values for Soils | | Soil Component of the Groundwater Ingestion Exposure Route Values | | |  |
| CAS No. | Chemical Name | Ingestion  (mg/kg) | Inhalation  (mg/kg) | | Class I  (mg/kg) | Class II  (mg/kg) | ADL  (mg/kg) |
| 107-06-2 | 1,2-Dichloroethane (Ethylene dichloride) | 7e | 0.4e | | 0.02 | 0.1 | \* |
| 75-35-4 | 1,1-Dichloroethylene | 3,900b | 290b | | 0.06 | 0.3 | \* |
| 156-59-2 | *cis*-1,2-Dichloroethylene | 780b | 1,200d | | 0.4 | 1.1 | \* |
| 156-60-5 | *trans*-1,2-Dichloroethylene | 1,600b | 3,100d | | 0.7 | 3.4 | \* |
| 78-87-5 | 1,2-Dichloropropane | 9e | 15b | | 0.03 | 0.15 | \* |
| 542-75-6 | 1,3-Dichloropropene (1,3-Dichloropropylene, *cis* + *trans*) | 6.4e | 1.1e | | 0.004e | 0.02 | 0.005 |
| 60-57-1 | Dieldrinn | 0.04e | 1e | | 0.004e | 0.02 | 0.603 |
| 84-66-2 | Diethyl phthalate | 63,000b | 2,000d | | 470b | 470 | \* |
| 105-67-9 | 2,4-Dimethylphenol | 1,600b | ---c | | 9b | 9 | \* |
| 121-14-2 | 2,4-Dinitrotoluene | 0.9e | ---c | | 0.0008e,f | 0.0008 | 0.250 |
| 606-20-2 | 2,6-Dinitrotoluene | 0.9e | ---c | | 0.0007e,f | 0.0007 | 0.260 |
| 117-84-0 | Di-*n*-octyl phthalate | 1,600b | 10,000d | | 10,000d | 10,000d | \* |
| 115-29-7 | Endosulfano | 470b | ---c | | 18b | 90 | \* |
| 145-73-3 | Endothallo | 1,600b | ---c | | 0.4 | 0.4 | NA |
| 72-20-8 | Endrin | 23b | ---c | | 1 | 5 | \* |
| 100-41-4 | Ethylbenzene | 7,800b | 400d | | 13 | 19 | \* |
| 206-44-0 | Fluoranthene | 3,100b | ---c | | 4,300b | 21,000 | \* |
| 86-73-7 | Fluorene | 3,100b | ---c | | 560b | 2,800 | \* |
| 76-44-8 | Heptachlor | 0.1e | 0.1e | | 23 | 110 | 0.871 |
| 1024-57-3 | Heptachlor epoxide | 0.07e | 5e | | 0.7 | 3.3 | 1.005 |
| 118-74-1 | Hexachlorobenzene | 0.4e | 1e | | 2 | 11 | \* |
| 319-84-6 | *alpha*-HCH (*alpha*-BHC) | 0.1e | 0.8e | | 0.0005e | 0.003 | 0.0074 |

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| --- | --- | --- | --- | --- | --- | --- |
|  | | Exposure Route-Specific Values for Soils | | Soil Component of the Groundwater Ingestion Exposure Route Values | |  |
| CAS No. | Chemical Name | Ingestion  (mg/kg) | Inhalation  (mg/kg) | Class I  (mg/kg) | Class II  (mg/kg) | ADL  (mg/kg) |
| 58-89-9 | *gamma*-HCH (Lindane)n | 0.5e,x | ---c | 0.009 | 0.047 | \* |
| 77-47-4 | Hexachlorocyclopentadiene | 550b,x | 10b | 400 | 2,200d | \* |
| 67-72-1 | Hexachloroethane | 78b | ---c | 0.5b | 2.6 | \* |
| 193-39-5 | Indeno(1,2,3-*c,d*)pyrene | 0.9e,w | ---c | 14 | 69 | \* |
| 78-59-1 | Isophorone | 15,600b | 4,600d | 8b | 8 | \* |
| 72-43-5 | Methoxychloro | 390b | ---c | 160 | 780 | \* |
| 74-83-9 | Methyl bromide  (Bromomethane) | 110b | 10b,x | 0.2b | 1.2 | \* |
| 75-09-2 | Methylene chloride  (Dichloromethane) | 85e | 13e | 0.02e | 0.2 | \* |
| 95-48-7 | 2-Methylphenol  (*o* - Cresol) | 3,900b | ---c | 15b | 15 | \* |
| 91-20-3 | Naphthalene | 1,600 b | 170b,x | 12 b | 18 | \* |
| 98-95-3 | Nitrobenzene | 39b | 92b,x | 0.1b | 0.1 | 0.26 |
| 86-30-6 | *N*-Nitrosodiphenylamine | 130e | ---c | 1e | 5.6 | \* |
| 621-64-7 | *N*-Nitrosodi-*n*-propylamine | 0.09e | ---c | 0.00005e | 0.00005 | 0.0018 |
| 108-95-2 | Phenol | 23,000b | ---c | 100b | 100 | \* |
| 1918-02-1 | Picloramo | 5,500b | ---c | 2 | 20 | NA |
| 1336-36-3 | Polychlorinated biphenyls (PCBs)n | 1h | ---c,h | ---h | ---h | \* |
| 129-00-0 | Pyrene | 2,300b | ---c | 4,200b | 21,000 | \* |
| 122-34-9 | Simazineo | 390b | ---c | 0.04 | 0.37 | NA |
| 100-42-5 | Styrene | 16,000b | 1,500d,x | 4 | 18 | \* |
| 127-18-4 | Tetrachloroethylene  (Perchloroethylene) | 12e | 11e | 0.06 | 0.3 | \* |
| 108-88-3 | Toluene | 16,000b | 650d,x | 12 | 29 | \* |

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| --- | --- | --- | --- | --- | --- | --- | --- |
|  | | Exposure Route-Specific Values for Soils | | Soil Component of the Groundwater Ingestion Exposure Route Values | |  | |
| CAS No. | Chemical Name | Ingestion  (mg/kg) | Inhalation  (mg/kg) | Class I  (mg/kg) | Class II  (mg/kg) | ADL  (mg/kg) |
| 8001-35-2 | Toxaphenen | 0.6e | 89e | 31 | 150 | \* |
| 120-82-1 | 1,2,4-Trichlorobenzene | 780b | 3,200b,x | 5 | 53 | \* |
| 71-55-6 | 1,1,1-Trichloroethane | ---c | 1,200d | 2 | 9.6 | \* |
| 79-00-5 | 1,1,2-Trichloroethane | 310b | 1,800d | 0.02 | 0.3 | \* |
| 79-01-6 | Trichloroethylene | 58e | 5e | 0.06 | 0.3 | \* |
| 108-05-4 | Vinyl acetate | 78,000b | 1,000b,x | 170b | 170 | \* |
| 75-01-4 | Vinyl chloride | 0.46e | 0.28e | 0.01 | 0.07 | \* |
| 108-38-3 | m-Xylene | 16,000b | 420d,x | 210 | 210 | \* |
| 95-47-6 | o-Xylene | 16,000b | 410d,x | 190 | 190 | \* |
| 106-42-3 | p-Xylene | 16,000b1 | 460d,x | 200 | 200 | \* |
| 1330-20-7 | Xylenes (total) | 16,000b | 320d,x | 150 | 150 | \* |

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| --- | --- | --- | --- | --- | --- | --- | --- |
|  | | Exposure Route-Specific Values for Soils | | Soil Component of the Groundwater Ingestion Exposure Route Values | | |  |
| CAS No. | Chemical Name | Ingestion  (mg/kg) | Inhalation  (mg/kg) | Class I  (mg/kg) | Class II  (mg/kg) | ADL  (mg/kg) | |
|  | **Ionizable Organics** |  |  |  |  |  | |
| 65-85-0 | Benzoic Acid | 310,000b | ---c | 400b,i | 400i | \* | |
| 95-57-8 | 2-Chlorophenol | 390b | 53,000d | 4b,i | 4i | \* | |
| 120-83-2 | 2,4-Dichlorophenol | 230b | ---c | 1b,i | 1i | \* | |
| 51-28-5 | 2,4-Dinitrophenol | 160b | ---c | 0.2b | 0.2 | 3.3 | |
| 88-85-7 | Dinosebo | 78b | ---c | 0.34b,i | 3.4i | \* | |
| 87-86-5 | Pentachlorophenol | 3e,j | ---c | 0.03i | 0.14i | \* | |
| 93-72-1 | 2,4,5-TP (Silvex) | 630b | ---c | 11i | 55i | \* | |
| 95-95-4 | 2,4,5-Trichlorophenol | 7,800b | ---c | 270b,i | 1,400i | \* | |
| 88-06-2 | 2,4,6 Trichlorophenol | 58e | 200e | 0.2e,i | 0.77i | 0.66 | |

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| --- | --- | --- | --- | --- | --- | --- |
|  | | Exposure Route-Specific Values for Soils | | Soil Component of the Groundwater Ingestion Exposure Route Values | |  |
| CAS No. | Chemical Name | Ingestion  (mg/kg) | Inhalation  (mg/kg) | Class I  (mg/L) | Class II  (mg/L) | ADL  (mg/kg) |
|  | **Inorganics** |  |  |  |  |  |
| 7440-36-0 | Antimony | 31b | ---c | 0.006m | 0.024m | \* |
| 7440-38-2 | Arsenicl,n | t | 750e | 0.05m | 0.2m | \* |
| 7440-39-3 | Barium | 5,500b | 690,000b | 2.0m | 2.0m | \* |
| 7440-41-7 | Beryllium | 160b | 1,300e | 0.004m | 0.5m | \* |
| 7440-42-8 | Boron | 16,000b | ---g | 2.0m | 2.0m | \* |
| 7440-43-9 | Cadmiuml,n | 78b, r | 1,800e | 0.005m | 0.05m | \* |
| 16887-00-6 | Chloride | ---c | ---c | 200m | 200m | \* |
| 7440-47-3 | Chromium, total | 230 b | 270e | 0.1m | 1.0m | \* |
| 16065-83-1 | Chromium, ion, trivalent | 120,000 b | ---c | ---g | ---g | \* |
| 18540-29-9 | Chromium, ion, hexavalent | 230 b | 270e | --- | --- | \* |
| 7440-48-4 | Cobalt | 4,700b | ---c | 1.0m | 1.0m | \* |
| 7440-50-8 | Coppern | 2,900b | ---c | 0.65m | 0.65m | \* |
| 57-12-5 | Cyanide (amenable) | 1,600b | ---c | 0.2q,m | 0.6q,m | \* |
| 7782-41-4 | Fluoride | 4,700b | ---c | 4.0m | 4.0m | \* |
| 15438-31-0 | Iron | ---c | ---c | 5.0m | 5.0m | \* |
| 7439-92-1 | Lead | 400k | ---c | 0.0075m | 0.1m | \* |
| 7439-95-4 | Magnesiumn | 325,000 | ---c | ---c | ---c | \* |
| 7439-96-5 | Manganese | 1,600b,v | 69,000b,x | 0.15m | 10.0m | \* |
| 7439-97-6 | Mercuryl,n,s | 23b | 10b | 0.002m | 0.01m | \* |
| 7440-02-0 | Nickell | 1,600b | 13,000e | 0.1m | 2.0m | \* |
| 14797-55-8 | Nitrate as Np | 130,000b | ---c | 10.0q,m | 100q | \* |

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| --- | --- | --- | --- | --- | --- | --- |
|  |  | Exposure Route-specific Values for Soils | | Soil Component of the Groundwater Ingestion Exposure Route Values | |  |
| CAS No. | Chemical Name | Ingestion  (mg/kg) | Inhalation  (mg/kg) | Class I  (mg/L) | Class II  (mg/L) | ADL  (mg/kg) |
| 7723-14-0 | Phosphorusn | ---g | ---c | ---c | ---c | \* |
| 7440-09-7 | Potassiumn | ---g | ---c | ---c | ---c | \* |
| 7782-49-2 | Seleniuml,n | 390b | ---c | 0.05m | 0.05m | \* |
| 7440-22-4 | Silver | 390b | ---c | 0.05m | --- | \* |
| 7440-23-5 | Sodiumn | ---g | ---c | ---c | ---c | \* |
| 14808-79-8 | Sulfate | ---c | ---c | 400m | 400m | \* |
| 7440-28-0 | Thallium | ­6.3b,u | ---c | 0.002m | 0.02m | \* |
| 7440-62-2 | Vanadium | 550b | ---c | 0.049m | 0.1m | \* |
| 7440-66-6 | Zincl | 23,000b | ---c | 5.0m | 10m | \* |

"\*" Indicates that the ADL is less than or equal to the specified remediation objective.

NA means not available; no PQL or EQL available in USEPA analytical methods.

Chemical Name and Soil Remediation Objective Notations

a Soil remediation objectives based on human health criteria only.

b Calculated values correspond to a target hazard quotient of 1.

c No toxicity criteria available for the route of exposure.

d Soil saturation concentration (C[sat]) = the concentration at which the absorptive limits of the soil particles, the solubility limits of the available soil moisture, and saturation of soil pore air have been reached. Above the soil saturation concentration, the assumptions regarding vapor transport to air and/or dissolved phase transport to groundwater (for chemicals which are liquid at ambient soil temperatures) have been violated, and alternative modeling approaches are required.

e Calculated values correspond to a cancer risk level of 1 in 1,000,000.

g Chemical-specific properties are such that this route is not of concern at any soil contaminant concentration.

h 40 CFR 761 contains applicability requirements and methodologies for the development of PCB remediation objectives. Requests for approval of a Tier 3 evaluation must address the applicability of 40 CFR 761.

i Soil remediation objective for pH of 6.8. If soil pH is other than 6.8, refer to Appendix B, Tables C and D of this Part.

j Ingestion soil remediation objective adjusted by a factor of 0.5 to account for dermal route.

k A preliminary remediation goal of 400 mg/kg has been set for lead based on *Revised Interim Soil Lead Guidance for CERCLA Sites and RCRA Corrective Action Facilities*, OSWER Directive #9355.4-12.

l Potential for soil-plant-human exposure.

m The person conducting the remediation has the option to use: (1) TCLP or SPLP test results to compare with the remediation objectives listed in this Table; (2) where applicable, the total amount of contaminant in the soil sample results to compare with pH specific remediation objectives listed in Appendix B, Table C or D of this Part (see Section 742.510); or (3) the appropriate background value listed in Appendix A, Table G. If the person conducting the remediation wishes to calculate soil remediation objectives based on background concentrations, this should be done in accordance with Subpart D of this Part.

n The Agency reserves the right to evaluate the potential for remaining contaminant concentrations to pose significant threats to crops, livestock, or wildlife.

o For agrichemical facilities, remediation objectives for surficial soils which are based on field application rates may be more appropriate for currently registered pesticides. Consult the Agency for further information.

p For agrichemical facilities, soil remediation objectives based on site-specific background concentrations of Nitrate as N may be more appropriate. Such determinations shall be conducted in accordance with the procedures set forth in Subparts D and I of this Part.

q The TCLP extraction must be done using water at a pH of 7.0.

r Value based on dietary Reference Dose.

s Value for Ingestion based on Reference Dose for Mercuric chloride (CAS No. 7487-94-7); value for Inhalation based on Reference Concentration for elemental Mercury (CAS No. 7439-97-6). Inhalation remediation objective only applies at sites where elemental mercury is a contaminant of concern.

t For the ingestion route for arsenic, see 742.Appendix A, Table G.

u Value based on Reference Dose for Thallium sulfate (CAS No. 7446-18-6).

v Value based on Reference Dose adjusted for dietary intake.

w For sites located in any populated area as defined in Section 742.200, Appendix A, Table H may be used.

x The remediation objectives for these chemicals must also include the construction worker inhalation objective in Appendix B, Table B.

(Source: Amended at 31 Ill. Reg. 4063, effective February 23, 2007)