



# **RCRA Draft Supplemental Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway (Vapor Intrusion Guidance)**

Table 3: Soil Gas and Groundwater  
Criteria for Scenario-Specific  
Vapor Attenuation Coefficients

December 2001

Table 3: Soil Gas and Groundwater Criteria for Scenario-Specific Vapor Attenuation Coefficients ( $\alpha$ )

CAS No.	Chemical	Target Soil Gas Concentration for =0.003		Target Ground Water Concentration for =0.003	Target Soil Gas Concentration for =0.001		Target Ground Water Concentration for =0.001	Target Soil Gas Concentration for =0.0003		Target Ground Water Concentration for =0.0003	Target Soil Gas Concentration for =0.0001		Target Ground Water Concentration for =0.0001
		$C_{\text{soil-gas}}$ (ug/m <sup>3</sup> )	(ppbv)		$C_{\text{soil-gas}}$ (ug/m <sup>3</sup> )	(ppbv)		$C_{\text{soil-gas}}$ (ug/m <sup>3</sup> )	(ppbv)		$C_{\text{soil-gas}}$ (ug/m <sup>3</sup> )	(ppbv)	
71556	1,1,1-Trichloroethane	3.3E+05	6.1E+04	4.7E+02	1.0E+06	1.8E+05	1.4E+03	3.3E+06	6.1E+05	4.7E+03	1.0E+07	1.8E+06	1.4E+04
79345	1,1,2,2-Tetrachloroethane	5.7E+01	8.4E+00	4.1E+00	1.7E+02	2.5E+01	1.2E+01	5.7E+02	8.4E+01	4.1E+01	1.7E+03	2.5E+02	1.2E+02
79005	1,1,2-Trichloroethane	2.1E+02	3.8E+01	5.6E+00	6.3E+02	1.1E+02	1.7E+01	2.1E+03	3.8E+02	5.6E+01	6.3E+03	1.1E+03	1.7E+02
75343	1,1-Dichloroethane	1.7E+05	4.1E+04	7.2E+02	5.0E+05	1.2E+05	2.2E+03	1.7E+06	4.1E+05	7.2E+03	5.0E+06	1.2E+06	2.2E+04
75354	1,1-Dichloroethylene	6.7E+01	1.7E+01	6.2E-02	2.0E+02	5.0E+01	1.9E-01	6.7E+02	1.7E+02	6.2E-01	2.0E+03	5.0E+02	1.9E+00
120821	1,2,4-Trichlorobenzene	6.7E+04	9.0E+03	1.1E+03	2.0E+05	2.7E+04	3.4E+03	6.7E+05	9.0E+04	1.1E+04	2.0E+06	2.7E+05	3.4E+04
95501	1,2-Dichlorobenzene	6.7E+04	1.1E+04	8.6E+02	2.0E+05	3.3E+04	2.6E+03	6.7E+05	1.1E+05	8.6E+03	2.0E+06	3.3E+05	2.6E+04
107062	1,2-Dichloroethane	1.3E+02	3.2E+01	3.2E+00	3.8E+02	9.5E+01	9.6E+00	1.3E+03	3.2E+02	3.2E+01	3.8E+03	9.5E+02	9.6E+01
78875	1,2-Dichloropropane	1.3E+03	2.9E+02	1.2E+01	4.0E+03	8.7E+02	3.5E+01	1.3E+04	2.9E+03	1.2E+02	4.0E+04	8.7E+03	3.5E+02
542756	1,3-Dichloropropene	8.3E+02	1.8E+02	1.1E+00	2.5E+03	5.5E+02	3.4E+00	8.3E+03	1.8E+03	1.1E+01	2.5E+04	5.5E+03	3.4E+01
106467	1,4-Dichlorobenzene	2.7E+05	4.4E+04	2.7E+03	8.0E+05	1.3E+05	8.0E+03	2.7E+06	4.4E+05	2.7E+04	**	**	**
95954	2,4,5-Trichlorophenol	1.2E+05	1.4E+04	6.6E+05	**	**	**	**	**	**	**	**	**
88062	2,4,6-Trichlorophenol	1.1E+03	1.3E+02	3.4E+03	3.2E+03	4.0E+02	1.0E+04	1.1E+04	1.3E+03	3.4E+04	3.2E+04	4.0E+03	1.0E+05
120832	2,4-Dichlorophenol	3.7E+03	5.5E+02	2.8E+04	1.1E+04	1.7E+03	8.5E+04	3.7E+04	5.5E+03	2.8E+05	1.1E+05	1.7E+04	8.5E+05
105679	2,4-Dimethylphenol	2.3E+04	4.7E+03	2.8E+05	7.0E+04	1.4E+04	8.5E+05	2.3E+05	4.7E+04	2.8E+06	**	**	**
51285	2,4-Dinitrophenol	2.3E+03	3.1E+02	1.3E+05	7.0E+03	9.3E+02	3.8E+05	2.3E+04	3.1E+03	1.3E+06	**	**	**
121142	2,4-Dinitrotoluene	1.8E+01	2.4E+00	4.6E+03	5.3E+01	7.1E+00	1.4E+04	1.8E+02	2.4E+01	4.6E+04	5.3E+02	7.1E+01	1.4E+05
606202	2,6-Dinitrotoluene	1.8E+01	2.4E+00	5.7E+02	5.3E+01	7.1E+00	1.7E+03	1.8E+02	2.4E+01	5.7E+03	5.3E+02	7.1E+01	1.7E+04
95578	2-Chlorophenol	6.0E+03	1.1E+03	3.8E+02	1.8E+04	3.4E+03	1.1E+03	6.0E+04	1.1E+04	3.8E+03	1.8E+05	3.4E+04	1.1E+04
95487	2-Methylphenol (o-cresol)	6.0E+04	1.4E+04	1.2E+06	1.8E+05	4.1E+04	3.7E+06	6.0E+05	1.4E+05	1.2E+07	**	**	**
91941	3,3-Dichlorobenzidine	**	**	**	**	**	**	**	**	**	**	**	**
83329	Acenaphthene	**	**	**	**	**	**	**	**	**	**	**	**
67641	Acetone	1.2E+05	4.9E+04	7.3E+04	3.5E+05	1.5E+05	2.2E+05	1.2E+06	4.9E+05	7.3E+05	3.5E+06	1.5E+06	2.2E+06
309002	Aldrin	6.8E-01	4.6E-02	9.8E-02	2.0E+00	1.4E-01	2.9E-01	6.8E+00	4.6E-01	9.8E-01	2.0E+01	1.4E+00	2.9E+00
319846	alpha-HCH (alpha-BHC)	1.9E+00	1.6E-01	4.3E+00	5.6E+00	4.7E-01	1.3E+01	1.9E+01	1.6E+00	4.3E+01	5.6E+01	4.7E+00	1.3E+02
120127	Anthracene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
56553	Benz(a)anthracene	**	**	**	**	**	**	**	**	**	**	**	**
71432	Benzene	4.3E+02	1.3E+02	1.9E+00	1.3E+03	4.0E+02	5.6E+00	4.3E+03	1.3E+03	1.9E+01	1.3E+04	4.0E+03	5.6E+01
50328	Benzo(a)pyrene	**	**	**	**	**	**	**	**	**	**	**	**
205992	Benzo(b)fluoranthene	**	**	**	**	**	**	**	**	**	**	**	**
207089	Benzo(k)fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
65850	Benzoic Acid	**	**	**	**	**	**	**	**	**	**	**	**
319857	beta-HCH (beta-BHC)	6.3E+00	5.3E-01	2.1E+02	**	**	**	**	**	**	**	**	**
111444	Bis(2-chloroethyl)ether	1.0E+01	1.7E+00	1.4E+01	3.0E+01	5.2E+00	4.1E+01	1.0E+02	1.7E+01	1.4E+02	3.0E+02	5.2E+01	4.1E+02
117817	Bis(2-ethylhexyl)phthalate	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
75274	Bromodichloromethane	1.9E+02	2.8E+01	2.8E+00	5.6E+02	8.3E+01	8.5E+00	1.9E+03	2.8E+02	2.8E+01	5.6E+03	8.3E+02	8.5E+01
75252	Bromoform	3.0E+03	2.9E+02	1.4E+02	9.1E+03	8.8E+02	4.2E+02	3.0E+04	2.9E+03	1.4E+03	9.1E+04	8.8E+03	4.2E+03
71363	Butanol	1.2E+05	3.9E+04	3.2E+05	3.5E+05	1.2E+05	9.7E+05	1.2E+06	3.9E+05	3.2E+06	3.5E+06	1.2E+06	9.7E+06
85687	Butyl benzyl phthalate	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
86748	Carbazole	**	**	**	**	**	**	**	**	**	**	**	**
75150	Carbon disulfide	2.3E+05	7.5E+04	1.9E+02	7.0E+05	2.2E+05	5.6E+02	2.3E+06	7.5E+05	1.9E+03	7.0E+06	2.2E+06	5.6E+03
56235	Carbon tetrachloride	2.2E+02	3.5E+01	1.8E-01	6.7E+02	1.1E+02	5.3E-01	2.2E+03	3.5E+02	1.8E+00	6.7E+03	1.1E+03	5.3E+00
57749	Chlordane	3.3E+01	2.0E+00	1.7E+01	1.0E+02	6.0E+00	5.0E+01	**	**	**	**	**	**
108907	Chlorobenzene	6.7E+03	1.4E+03	4.4E+01	2.0E+04	4.3E+03	1.3E+02	6.7E+04	1.4E+04	4.4E+02	2.0E+05	4.3E+04	1.3E+03
124481	Chlorodibromomethane	1.4E+02	1.6E+01	4.3E+00	4.2E+02	4.9E+01	1.3E+01	1.4E+03	1.6E+02	4.3E+01	4.2E+03	4.9E+02	1.3E+02
67663	Chloroform	1.4E+02	3.0E+01	9.7E-01	4.3E+02	8.9E+01	2.9E+00	1.4E+03	3.0E+02	9.7E+00	4.3E+03	8.9E+02	2.9E+01
218019	Chrysene	**	**	**	**	**	**	**	**	**	**	**	**
156592	cis-1,2-Dichloroethylene	1.2E+04	2.9E+03	7.0E+01	3.5E+04	8.8E+03	2.1E+02	1.2E+05	2.9E+04	7.0E+02	3.5E+05	8.8E+04	2.1E+03
72548	DDD	**	**	**	**	**	**	**	**	**	**	**	**

Table 3: Soil Gas and Groundwater Criteria for Scenario-Specific Vapor Attenuation Coefficients ( $\alpha$ )

CAS No.	Chemical	Target Soil Gas Concentration for =0.003 $C_{\text{soil-gas}}$		Target Ground Water Concentration for =0.003 $C_{\text{gw}}$	Target Soil Gas Concentration for =0.001 $C_{\text{soil-gas}}$		Target Ground Water Concentration for =0.001 $C_{\text{gw}}$	Target Soil Gas Concentration for =0.0003 $C_{\text{soil-gas}}$		Target Ground Water Concentration for =0.0003 $C_{\text{gw}}$	Target Soil Gas Concentration for =0.0001 $C_{\text{soil-gas}}$		Target Ground Water Concentration for =0.0001 $C_{\text{gw}}$
		( $\mu\text{g}/\text{m}^3$ )	(ppbv)		( $\mu\text{g}/\text{m}^3$ )	(ppbv)		( $\mu\text{g}/\text{m}^3$ )	(ppbv)		( $\mu\text{g}/\text{m}^3$ )	(ppbv)	
72559	DDE	3.4E+01	2.6E+00	4.0E+01	1.0E+02	7.9E+00	1.2E+02	**	**	**	**	**	**
50293	DDT	**	**	**	**	**	**	**	**	**	**	**	**
84742	Di-n-butyl phthalate	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
117840	Di-n-octyl phthalate	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
53703	Dibenz(a,h)anthracene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
60571	Dieldrin	7.2E-01	4.7E-02	1.2E+00	2.2E+00	1.4E-01	3.5E+00	7.2E+00	4.7E-01	1.2E+01	2.2E+01	1.4E+00	3.5E+01
84662	Diethylphthalate	**	**	**	**	**	**	**	**	**	**	**	**
115297	Endosulfan	**	**	**	**	**	**	**	**	**	**	**	**
72208	Endrin	**	**	**	**	**	**	**	**	**	**	**	**
100414	Ethylbenzene	3.3E+05	7.7E+04	1.0E+03	1.0E+06	2.3E+05	3.1E+03	3.3E+06	7.7E+05	1.0E+04	1.0E+07	2.3E+06	3.1E+04
206440	Fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
86737	Fluorene	**	**	**	**	**	**	**	**	**	**	**	**
58899	gamma-HCH (Lindane)	9.0E+00	7.6E-01	1.6E+01	2.7E+01	2.3E+00	4.7E+01	9.0E+01	7.6E+00	1.6E+02	2.7E+02	2.3E+01	4.7E+02
76448	Heptachlor	2.6E+00	1.7E-01	5.7E-02	7.7E+00	5.0E-01	1.7E-01	2.6E+01	1.7E+00	5.7E-01	7.7E+01	5.0E+00	1.7E+00
1024573	Heptachlor epoxide	1.3E+00	8.1E-02	3.3E+00	3.8E+00	2.4E-01	9.9E+00	1.3E+01	8.1E-01	3.3E+01	3.8E+01	2.4E+00	9.9E+01
87683	Hexachloro-1,3-butadiene	1.5E+02	1.4E+01	4.5E-01	4.5E+02	4.3E+01	1.4E+00	1.5E+03	1.4E+02	4.5E+00	4.5E+03	4.3E+02	1.4E+01
118741	Hexachlorobenzene	7.2E+00	6.2E-01	1.3E-01	2.2E+01	1.9E+00	4.0E-01	7.2E+01	6.2E+00	1.3E+00	2.2E+02	1.9E+01	4.0E+00
77474	Hexachlorocyclopentadiene	6.7E+01	6.0E+00	6.0E-02	2.0E+02	1.8E+01	1.8E-01	6.7E+02	6.0E+01	6.0E-01	2.0E+03	1.8E+02	1.8E+00
67721	Hexachloroethane	8.3E+02	8.6E+01	5.2E+00	2.5E+03	2.6E+02	1.6E+01	8.3E+03	8.6E+02	5.2E+01	2.5E+04	2.6E+03	1.6E+02
193395	Indeno(1,2,3-cd)pyrene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
78591	Isophorone	1.2E+04	2.2E+03	4.5E+04	3.7E+04	6.6E+03	1.4E+05	1.2E+05	2.2E+04	4.5E+05	3.7E+05	6.6E+04	1.4E+06
108383	m-Xylene	2.3E+06	5.4E+05	7.8E+03	7.0E+06	1.6E+06	2.3E+04	2.3E+07	5.4E+06	7.8E+04	**	**	**
7439976	Mercury (elemental)	1.0E+02	1.2E+01	2.1E-01	3.0E+02	3.7E+01	6.4E-01	1.0E+03	1.2E+02	2.1E+00	3.0E+03	3.7E+02	6.4E+00
72435	Methoxychlor	**	**	**	**	**	**	**	**	**	**	**	**
74839	Methyl bromide	1.7E+03	4.3E+02	6.5E+00	5.0E+03	1.3E+03	2.0E+01	1.7E+04	4.3E+03	6.5E+01	5.0E+04	1.3E+04	2.0E+02
75092	Methylene chloride	7.1E+03	2.0E+03	7.9E+01	2.1E+04	6.1E+03	2.4E+02	7.1E+04	2.0E+04	7.9E+02	2.1E+05	6.1E+04	2.4E+03
1634044	MTBE	1.0E+06	2.8E+05	4.4E+04	3.0E+06	8.3E+05	1.3E+05	1.0E+07	2.8E+06	4.4E+05	3.0E+07	8.3E+06	1.3E+06
621647	N-Nitrosodi-n-propylamine	1.7E+00	3.1E-01	1.8E+01	5.0E+00	9.4E-01	5.4E+01	1.7E+01	3.1E+00	1.8E+02	5.0E+01	9.4E+00	5.4E+02
86306	N-Nitrosodiphenylamine	2.4E+03	2.9E+02	1.2E+04	7.1E+03	8.8E+02	3.5E+04	**	**	**	**	**	**
91203	Naphthalene	1.0E+03	1.9E+02	5.1E+01	3.0E+03	5.7E+02	1.5E+02	1.0E+04	1.9E+03	5.1E+02	3.0E+04	5.7E+03	1.5E+03
98953	Nitrobenzene	6.7E+02	1.3E+02	6.8E+02	2.0E+03	4.0E+02	2.0E+03	6.7E+03	1.3E+03	6.8E+03	2.0E+04	4.0E+03	2.0E+04
95476	o-Xylene	2.3E+06	5.4E+05	1.1E+04	7.0E+06	1.6E+06	3.3E+04	2.3E+07	5.4E+06	1.1E+05	**	**	**
106478	p-Chloroaniline	4.7E+03	8.9E+02	3.4E+05	1.4E+04	2.7E+03	1.0E+06	4.7E+04	8.9E+03	3.4E+06	**	**	**
106423	p-Xylene	2.3E+06	5.4E+05	7.4E+03	7.0E+06	1.6E+06	2.2E+04	2.3E+07	5.4E+06	7.4E+04	**	**	**
87865	Pentachlorophenol	9.8E+01	9.0E+00	9.8E+04	2.9E+02	2.7E+01	2.9E+05	9.8E+02	9.0E+01	9.8E+05	**	**	**
108952	Phenol	7.0E+05	1.8E+05	4.3E+07	**	**	**	**	**	**	**	**	**
129000	Pyrene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
100425	Styrene	3.3E+05	7.8E+04	2.9E+03	1.0E+06	2.3E+05	8.8E+03	3.3E+06	7.8E+05	2.9E+04	1.0E+07	2.3E+06	8.8E+04
127184	Tetrachloroethylene	5.7E+03	8.5E+02	7.6E+00	1.7E+04	2.5E+03	2.3E+01	5.7E+04	8.5E+03	7.6E+01	1.7E+05	2.5E+04	2.3E+02
108883	Toluene	1.3E+05	3.5E+04	4.9E+02	4.0E+05	1.1E+05	1.5E+03	1.3E+06	3.5E+05	4.9E+03	4.0E+06	1.1E+06	1.5E+04
8001352	Toxaphene	1.0E+01	6.2E-01	4.2E+01	3.1E+01	1.8E+00	1.3E+02	1.0E+02	6.2E+00	4.2E+02	**	**	**
156605	trans-1,2-Dichloroethylene	2.3E+04	5.9E+03	6.1E+01	7.0E+04	1.8E+04	1.8E+02	2.3E+05	5.9E+04	6.1E+02	7.0E+05	1.8E+05	1.8E+03
79016	Trichloroethylene	2.0E+03	3.7E+02	4.6E+00	5.9E+03	1.1E+03	1.4E+01	2.0E+04	3.7E+03	4.6E+01	5.9E+04	1.1E+04	1.4E+02
108054	Vinyl acetate	6.7E+04	1.9E+04	3.2E+03	2.0E+05	5.7E+04	9.5E+03	6.7E+05	1.9E+05	3.2E+04	2.0E+06	5.7E+05	9.5E+04
75014	Vinyl chloride (chloroethene)	7.6E+02	3.0E+02	6.8E-01	2.3E+03	8.9E+02	2.0E+00	7.6E+03	3.0E+03	6.8E+00	2.3E+04	8.9E+03	2.0E+01

NA - health-based target breathing concentration exceeds maximum possible chemical vapor concentration (pathway incomplete)

\*\* - target soil gas concentration exceeds maximum possible vapor concentration at this soil gas to indoor air attenuation factor (pathway incomplete)