Table U-13e.

Surface Water-to-Aquatic Invertebrate Bioconcentration Factors

CPEC	log Kow[a,1]	log BCF[r]	Bioconcentration Factor (BCF): Water-to-Aquatic Invertebrates		
			Literature-Based (ww)	Literature-Based (dw)	Source
Inorganics					
Antimony	--	--	7	33.3	USEPA, 1999
Arsenic	--	--	73	348	USEPA, 1999
Barium	--	--	200	952	USEPA, 1999
Beryllium	--	--	45	214	USEPA, 1999
Cadmium	--	--	3461	16481	USEPA, 1999
Chromium	--	--	3000	14286	for Total Cr; USEPA, 1999
Cobalt	--	--	4066	19362	USEPA, 1999
Copper	--	--	3718	17705	USEPA, 1999
Lead	--	--	5059	24090	USEPA, 1999
Manganese	--	--	4066	19362	USEPA, 1999
Mercury	--	--	20184	96114	for mercuric chloride; USEPA, 1999
Molybdenum	--	--	4066	19362	USEPA, 1999
Nickel	--	--	28	133	USEPA, 1999
Selenium	--	--	1262	6010	USEPA, 1999
Silver	--	--	298	1419	USEPA, 1999
Sulfide	--	--	--	--	--
Thallium	--	--	15000	71429	USEPA, 1999
Tin	--	--	4066	19362	USEPA, 1999
Vanadium	--	--	4066	19362	USEPA, 1999
Zinc	--	--	4578	21800	USEPA, 1999
Polycyclic Aromatic Hydrocarbons (PAHs)					
Benzo(a)anthracene	--	--	12299	58567	USEPA, 1999
Benzo(a)pyrene	--	--	4697	22367	USEPA, 1999
Benzo(b)fluoranthene			4697	22367	B(a)P used as surrogate in document; USEPA, 1999
Benzo(g,h,i)perylene	6.58	4.24302	17499	83330	Calculated; USEPA, 1999
Dibenzo(a,h)anthracene	--	--	710	3381	USEPA, 1999
Naphthalene	3.3	1.5567	36	172	Calculated; USEPA, 1999
Semi-Volatile Organic Compounds (SVOCs)					
Bis(2-chloroethyl)ether	1.29	-0.08949	0.814	3.88	Calculated; USEPA, 1999
Bis(2-ethylhexyl)phthalate			318	1514	USEPA, 1999
N-Nitrosodiethylamine	0.48	-0.75288	0.177	0.841	Calculated; USEPA, 1999
N-Nitrosodipropylamine	1.36	-0.03216	0.929	4.42	Calculated; USEPA, 1999
N-Nitrosopyrrolidine	-0.19	-1.30161	0.0499	0.238	Calculated; USEPA, 1999

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Surface Water-to-Aquatic Invertebrate Bioconcentration Factors

CPEC	log Kow[a,1]	log BCF[r]	Bioconcentration Factor (BCF): Water-to-Aquatic Invertebrates		
			Literature-Based (ww)	Literature-Based (dw)	Source
Volatile Organic Compounds (VOCs)					
1,1-Dichloroethane	1.79	0.32001	2.09	9.95	Calculated; USEPA, 1999
1,2-Dibromoethane (EDB)	1.96	0.45924	2.88	13.7	Calculated; USEPA, 1999
Acetone			0.05	0.24	USEPA, 1999
Acetonitrile	-0.34	-1.42446	0.038	0.18	Calculated; USEPA, 1999
Carbon disulfide	1.94	0.44286	2.77	13.2	Calculated; USEPA, 1999
Ethylene glycol	-1.36	-2.25984	0.0055	0.03	Calculated; USEPA, 1999
Methyl isobutyl ketone (MIBK)	1.31	-0.07311	0.845	4.02	Calculated; USEPA, 1999
Methylene chloride	1.25	-0.12225	0.755	3.59	Calculated; USEPA, 1999
Nonanal	3.27	1.53213	34.1	162	Calculated; USEPA, 1999
Propanal	0.59	-0.66279	0.217	1.04	Calculated; USEPA, 1999
Trichloroethylene	2.42	0.83598	6.85	32.6	Calculated; USEPA, 1999

Table U-13e.

Footnotes for Bioaccumulation and Bioconcentration Factors

-- Not applicable.

BAF Bioaccumulation factor (unitless):

inv = soil-to-invertebrates.

plants = soil-to-plants.

mam = soil-to-mammals.

BCF Bioconcentration factor (unitless)

CPEC Chemical of potential ecological concern.

dw Dry weight.

NA Not available.

TEQ Toxic equivalent quotient.

[a] Sources for octanol-partitioning coefficient (log Kow) and water-organic carbon partitioning coefficient (Koc):

1 SRC database (2007).

2 Hazardous Substance Data Bank (2007).

3 Appendix 4-1 (USEPA, 2007) of EcoSSL Guidance (USEPA, 2007)

[b] These chemicals do not bioaccumulate in biota in accordance with USEPA (2007); VOCs and other chemicals with low log Kow (<3.5) do not bioaccumulate (USEPA, 2000); therefore, BAFs for these chemicals = 0.

[c] PAHs metabolize rapidly in wildlife (USEPA, 2007); therefore soil-to-wildlife BAF = 0 for PAHs.

[d] TCDD used as surrogate.

[e] Mean of inorganic empirical data of the metal CPECs identified in soil or sediment at the Site.

[f] Dieldrin used as a surrogate.

[g] Both the alpha and delta isomers were detected onsite. BAF data for the alpha-BHC is presented because plant and invertebrate BAFs were higher for this isomer. No data were available for the technical BHC mixture.

[h] Based on regression for all non-ionic contaminants (USEPA, 2007): log (BAF) = -0.4057 * (log Kow) + 1.781

[i] Only for CPECs where the Jager method was applied.

[j] Values for salt-marsh harvest mouse for uptake from plants (most conservative) based on Aroclor 1254.

[k] Nickel uptake to earthworms can not be accurately predicted with a regression model or BAF.

[l] Based on Travis and Arms (1988) model for uptake from soil-to-plants or from prey-to-mammals (see text).

[m] Aroclor 1260 used as a surrogate.

[n] BSAFs for total organochlorine pesticides (N=107) used.

[o] Endosulfan sulfate used as surrogate.

[p] Arochlor 1254 used as surrogate.

[q] Total PAH BSAF used due to lack of data.

[r] Calculated using equation (Southworth et.al., 1978): log(BCF) = 0.819 * logKow - 1.146

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