Georgia Environmental Protection Division
Approved Chemical Surrogates
DRAFT

Chemical	CAS #	Surrogate Chemical	Surrogate CAS #	Rationale
Acenaphthlyene	208-96-8	Acenaphthene	83-32-9	Acenaphthene is used in many studies alongside Acenaphthylene and vice versa due to their almost identical structure and function.
Barban	101-27-9	Linuron	330-55-2	Structurally similar with comparable modes of herbicidal action.
Benzo(g,h,i)perylene	191-24-2	Pyrene	129-00-0	Though Benzo(a)pyrene (BaP) is more structurally similar than pyrene, the research given for BghiP determines that it is not as harmful as BaP. Pyrene remains a conservative surrogate. "Experimental results demonstrate lower human genotoxicity profile of B[ghi]P than for benzo[a]pyrene. ANIMAL STUDIES: Benzo(ghi)perylene showed no tumorigenic effect in the respiratory tracts of rats when given at doses of 5 mg."
Bromodiphenyl Ether (p-BDE)	101-55-3	BDE-47	5436-43-1	Closest similar substance with a corresponding IRIS RfC toxicity factor.
Chlorophenyl phenyl ether, 4-	7005-72-3	Chlorobenzilate	510-15-6	Though Chlorobenzilate is not the first choice when it comes to surrogates, it's the closest surrogate to 4-CDE with approved toxicity factors available. It is also an epa recommended surrogate for similar chemicals like 4,4'-DCBP.
Dichlorobenzene, 1,3-	541-73-1	Dichlorobenzene, 1,4-	106-46-7	EPA Region 4 recommends that 1,3-DCB be evaluated using the non-cancer toxicity values of its surrogate 1,4-DCB only and that cancer risk not be calculated using the cancer-based surrogate toxicity values. Isomers of 1,3-DCB should be summed and compared to the calculated values.
Dichlorophenol, 2,6-	87-65-0	Dichlorophenol, 2,4-	120-83-2	Similar in all regards. Has a corresponding IRIS RfD toxicity factor.
Dichloropropane, 2,2-	594-20-7	Dichloropropane, 1,2-	78-87-5	Similar in all regards. Has corresponding PPRTV RfD and IRIS RfC toxicity factors.
Dichloropropene, 1,1-	563-58-6	Dichloropropene, 1,3-	542-75-6	Dichloropropene, 1,3- is the only dichloropropene with toxicity values. These values are provided by the EPA IRIS database. The isomers of 1,3-Dichloropropene should be summed and compared to 1,3-Dichloropropene's calculated values.
Dichloropropene, 1,2-	6923-20-3			
Dichloropropene, cis-1,3-	10061-01-5			
Dichloropropene, trans-1,3-	10061-02-6			
Dichloropropene, 2,3-	78-88-6			
Dimethyl phthalate	131-11-3	Diethyl phthalate	84-66-2	Similar in all regards. Has a corresponding IRIS RfD toxicity factor.
Dinitro-o-cresol, 4,6-*	534-52-1	Dinoseb	88-85-7	Dinoseb and Dinitro-o-cresol, 4,6- have a historical relationship. Dinoseb was developed as a closely related variant of DNOC. They use the same mode of action and are extremely similar structurally.
Endosulfan I	959-98-8	Endosulfan	115-29-7	The isomers, alpha- and beta-Endosulfan, should be summed and compared to Endosulfan's calculated values.
Endosulfan II	33213-65-9			
Endrin aldehyde	7421-93-4	Endrin	72-20-8	Endrin Ketone and Aldehyde are metabolites of Endrin. They should be summed and compared to Endrin's calculated values.
Endrin ketone	53494-70-5			
Methylcyclohexane*	108-87-2	Cyclohexane	110-82-7	Closest similar substance with a corresponding IRIS RfC toxicity factor.
Nitrophenol, 2-	88-75-5	Dinitrophenol, 2,4-	51-28-5	2,4-Dinitrophenol is similar in structure to 2-Nitrophenol, 3-Nitrophenol, and 4-Nitrophenol. It is also the closest in structure with noncancer toxicity factors. Though Nitrobenzene has toxicity factors, it doesn't have a phenol group like the others.
Nitrophenol, 3-	554-84-7			
Nitrophenol, 4-	100-02-7			
Phenanthrene	85-01-8	Pyrene	129-00-0	Pyrene is a similar PAH wiith the lowest reference dose, making it a conservative surrogate.
Tetrachlorophenol, 2,3,4,5-	4901-51-3	Tetrachlorophenol, 2,3,4,6-	58-90-2	
Tetrachlorophenols	25167-83-3	Tetrachlorophenol, 2,3,4,6-	58-90-2	
Chlordane, cis-	5103-71-9	Technical Chlordane	12789-03-6	These chemicals are the isomers and primary metabolites found in Technical Chlordane. Per USEPA Region 4, These isomers and primary metabolites should be summed and compared to Technical Chlordane values.
Chlordane, trans-	5103-74-2			
Nonachlor, trans-	39765-80-5			
Oxychlordane	27304-13-8			
Hexachlorocyclohexane, Alpha-	319-84-6	Hexachlorocyclohexane, Technical	608-73-1	These chemicals are the isomers and primary metabolites found in Technical Hexachlorocyclohexane. Per USEPA Region 4, These isomers and primary metabolites should be summed and compared to Technical Chlordane values.
Hexachlorocyclohexane, Beta-	319-85-7			
Hexachlorocyclohexane, Delta-	319-86-8			
Hexachlorocyclohexane, Epsilon	6108-10-7			
Hexachlorocyclohexane, Gamma-(Lindane)	58-89-9			

* : This substance has screening toxicity factors only. Deriving cleanup values using the screening toxicity factors is acceptable; however, a surrogate with appropriate toxicity factors has been provided for that option.