Table 2
OEHHA/ARB APPROVED ACUTE REFERENCE EXPOSURE LEVELS AND TARGET ORGANS

Substance	Chemical[b] Abstract Service Number (CAS)	Acute REL ($\mu g/m^3$)	Date[c] Value Reviewed [Added]	Target Organs[a]								
				Alimentary	Cardiovascular	Reproductive/[d] Development	Eye	Hematologic	Immune	Nervous	Respiratory	Skin
ACETALDEHYDE	75-07-0	4.7E+02	12/08				X				X	
ACROLEIN	107-02-8	2.5E+00	12/08				X				X	
ACRYLIC ACID	79-10-7	6.0E+03	4/99				X				X	
AMMONIA	7664-41-7	3.2E+03	4/99				X				X	
ARSENIC AND COMPOUNDS (INORGANIC)[TAC] [Including but not limited to: arsenic (inorganic oxides)]	7440-38-2 1016 [1015]	2.0E-01	12/08		X	X				X		
Arsenic acid	*7778-39-4*	*2.0E-01*	*12/08 [8/22]*		✓	✓				✓		
Arsenic pentoxide	*1303-28-2*	*2.0E-01*	*12/08 [8/22]*		✓	✓				✓		
Arsenic trioxide	*1327-53-3*	*2.0E-01*	*12/08 [8/22]*		✓	✓				✓		
ARSINE	7784-42-1	2.0E-01	12/08		X	X				X		
Calcium arsenate	*7778-44-1*	*2.0E-01*	*12/08 [8/22]*		✓	✓				✓		
Gallium arsenide	*1303-00-0*	*2.0E-01*	*12/08 [8/22]*		✓	✓				✓		
BENZENE[TAC]	71-43-2	2.7E+01	6/14			X		X	X			
BENZYL CHLORIDE	100-44-7	2.4E+02	4/99				X				X	
1,3-BUTADIENE[TAC]	106-99-0	6.6E+02	7/13			X						
CAPROLACTAM	105-60-2	5.0E+01	10/13				X					
CARBON DISULFIDE	75-15-0	6.2E+03	4/99			X				X		
CARBON MONOXIDE	630-08-0	2.3E+04	4/99		X							
CARBON TETRACHLORIDE[TAC] (Tetrachloromethane)	56-23-5	1.9E+03	4/99	X		X				X		
CARBONYL SULFIDE	463-58-1	6.6E+02	2/17							X		
CHLORINE	7782-50-5	2.1E+02	4/99				X				X	
CHLOROFORM[TAC]	67-66-3	1.5E+02	4/99			X				X	X	
CHLOROPICRIN	76-06-2	2.9E+01	4/99				X				X	
CHROMIUM (III)	16065-83-1	4.8E-01	8/22								X	
COPPER AND COMPOUNDS [Including but not limited to: copper fume (as copper)]	7440-50-8 [1067]	1.0E+02	4/99								X	
Cyanide Compounds (inorganic)	*57-12-5*	*3.4E+02*	*4/99*							✓		

Table 2
OEHHA/ARB APPROVED ACUTE REFERENCE EXPOSURE LEVELS AND TARGET ORGANS

Substance	Chemical[b] Abstract Service Number (CAS)	Acute REL (µg/m³)	Date[c] Value Reviewed [Added]	Target Organs[a]								
				Alimentary	Cardiovascular	Reproductive/[d] Development	Eye	Hematologic	Immune	Nervous	Respiratory	Skin
	1073											
Calcium cyanide	*592-01-8*	*3.4E+02*	*4/99 [8/22]*							✓		
HYDROGEN CYANIDE (Hydrocyanic acid)	74-90-8 341972-31-4 191234-22-7	3.4E+02	4/99							X		
Potassium cyanide	*151-50-8*	*3.4E+02*	*4/99 [8/22]*							✓		
Sodium cyanide	*143-33-9*	*3.4E+02*	*4/99 [8/22]*							✓		
1,4-DIOXANE (1,4-Diethylene dioxide)	123-91-1	3.0E+03	4/99				X				X	
EPICHLOROHYDRIN (1-Chloro-2,3-epoxypropane)	106-89-8	1.3E+03	4/99				X				X	
Fluorides and Compounds	*1101*	*2.4E+02*	*4/99*				✓				✓	
HYDROGEN FLUORIDE (Hydrofluoric acid)	7664-39-3	2.4E+02	4/99				X				X	
Modified Hydrogen fluoride {MHF}	*1141*	*2.4E+02*	*4/99 [8/22]*				✓				✓	
Selenium hexafluoride	*7783-79-1*	*2.4E+02*	*4/99 [8/22]*				✓				✓	
FORMALDEHYDE[TAC]	50-00-0	5.5E+01	12/08				X					
GLYCOL ETHERS	1115											
ETHYLENE GLYCOL BUTYL ETHER – EGBE	111-76-2	4.7E+03	5/18				X				X	
ETHYLENE GLYCOL ETHYL ETHER – EGEE	110-80-5	3.7E+02	4/99 [1/92]			X						
ETHYLENE GLYCOL ETHYL ETHER ACETATE - EGEEA	111-15-9	1.4E+02	4/99			X				X		
ETHYLENE GLYCOL METHYL ETHER – EGME	109-86-4	9.3E+01	4/99			X						
1,6-HEXAMETHYLENE DIISOCYANATE [i] (monomer)	822-06-0	3.0E-01	9/19								X	
HYDROCHLORIC ACID (Hydrogen chloride)	7647-01-0	2.1E+03	4/99				X				X	
HYDROGEN CYANIDE (Hydrocyanic acid) (see Cyanide Compounds)												
HYDROGEN FLUORIDE (Hydrofluoric acid) (see Fluorides & Compounds)												
HYDROGEN SELENIDE (see Selenium & Compounds)												
HYDROGEN SULFIDE	7783-06-4	4.2E+01	4/99 [7/90]							X		
ISOPROPYL ALCOHOL (Isopropanol)	67-63-0	3.2E+03	4/99				X				X	

Table 2
OEHHA/ARB APPROVED ACUTE REFERENCE EXPOSURE LEVELS AND TARGET ORGANS

Substance	Chemical[b] Abstract Service Number (CAS)	Acute REL (µg/m³)	Date[c] Value Reviewed [Added]	Target Organs[a]								
				Alimentary	Cardiovascular	Reproductive/[d] Development	Eye	Hematologic	Immune	Nervous	Respiratory	Skin
MERCURY AND COMPOUNDS (INORGANIC)	7439-97-6 [1133]	6.0E-01	12/08			X				X		
Mercuric chloride	*7487-94-7*	*6.0E-01*	*12/08*			✓				✓		
METHANOL	67-56-1	2.8E+04	4/99							X		
METHYL BROMIDE (Bromomethane)	74-83-9	3.9E+03	4/99			X				X	X	
METHYL CHLOROFORM (1,1,1-Trichloroethane)	71-55-6	6.8E+04	4/99							X		
METHYL ETHYL KETONE (2-Butanone)	78-93-3	1.3E+04	4/99				X				X	
METHYLENE CHLORIDE[TAC] (Dichloromethane)	75-09-2	1.4E+04	4/99		X					X		
METHYLENE DIPHENYL DIISOCYANATE	101-68-8	1.2E+01	3/16								X	
NICKEL AND COMPOUNDS[TAC]	7440-02-0 [1145]	2.0E-01	3/12						X			
Nickel acetate	*373-02-4*	*2.0E-01*	*3/12*						✓			
Nickel carbonate	*3333-67-3*	*2.0E-01*	*3/12*						✓			
Nickel carbonyl	*13463-39-3*	*2.0E-01*	*3/12*						✓			
Nickel chloride	*7718-54-9*	*2.0E-01*	*3/12 [8/22]*						✓			
Nickel hydroxide	*12054-48-7*	*2.0E-01*	*3/12*						✓			
Nickel nitrate {Nickel (II) nitrate}	*13138-45-9*	*2.0E-01*	*3/12 [8/22]*						✓			
Nickelocene	*1271-28-9*	*2.0E-01*	*3/12*						✓			
NICKEL OXIDE	*1313-99-1*	*2.0E-01*	*3/12*						✓			
Nickel refinery dust from the pyrometallurgical process	*1146*	*2.0E-01*	*3/12*						✓			
Nickel subsulfide	*12035-72-2*	*2.0E-01*	*3/12*						✓			
Nickel sulfate	*7786-81-4*	*2.0E-01*	*3/12 [8/22]*						✓			
NITRIC ACID	7697-37-2	8.6E+01	4/99								X	
NITROGEN DIOXIDE	10102-44-0	4.7E+02	4/99 [1/92]								X	
OZONE	10028-15-6	1.8E+02	4/99 [1/92]				X				X	
PERCHLOROETHYLENE[TAC] (Tetrachloroethylene)	127-18-4	2.0E+04	4/99				X			X	X	
PHENOL	108-95-2	5.8E+03	4/99				X				X	

Table 2
OEHHA/ARB APPROVED ACUTE REFERENCE EXPOSURE LEVELS AND TARGET ORGANS

Substance	Chemical[b] Abstract Service Number (CAS)	Acute REL (µg/m³)	Date[c] Value Reviewed [Added]	Target Organs[a]								
				Alimentary	Cardiovascular	Reproductive/[d] Development	Eye	Hematologic	Immune	Nervous	Respiratory	Skin
PHOSGENE	75-44-5	4.0E+00	4/99								X	
PROPYLENE OXIDE	75-56-9	3.1E+03	4/99			X	X				X	
POLYMERIC (OLIGO) HEXAMETHYLENE-1,6-DIISOCYANATE (HDI)	1221	4.5E+00	9/19 [8/22]								X	
BIURET	108-19-0	4.5E+00	9/19 [8/22]								X	
DIISOCYANURATE	1226	4.5E+00	9/19 [8/22]								X	
HDI PREPOLYMER	1227	4.5E+00	9/19 [8/22]								X	
ISOCYANURATE	1228	4.5E+00	9/19 [8/22]								X	
URETDIONE (HDI) {URETIDONE}	23501-81-7	4.5E+00	9/19 [8/22]								X	
Selenium and Compounds	*7782-49-2 [1170]*										X	
HYDROGEN SELENIDE	7783-07-5	5.0E+00	4/99				X				X	
Selenium hexafluoride see Fluorides and Compounds												
SODIUM HYDROXIDE	1310-73-2	8.0E+00	4/99				X				X	X
STYRENE	100-42-5	2.1E+04	4/99			X	X				X	
SULFATES	9960	1.2E+02	4/99								X	
SULFUR DIOXIDE	7446-09-5	6.6E+02	4/99 [1/92]								X	
SULFURIC ACID	7664-93-9	1.2E+02	4/99								X	
SULFUR TRIOXIDE	*7446-71-9*	*1.2E+02*	*4/99*								✓	
OLEUM	8014-95-7	1.2E+02	4/99								X	
TOLUENE	108-88-3	5.0E+03	8/20				X			X	X	
Toluene diisocyanates	*26471-62-5*	*2.0E+00*	*3/16*								✓	
TOLUENE-2,4-DIISOCYANATE	584-84-9	2.0E+00	3/16								X	
TOLUENE-2,6-DIISOCYANATE	91-08-7	2.0E+00	3/16								X	
TRIETHYLAMINE	121-44-8	2.8E+03	4/99				X			X		
Vanadium Compounds	*N/A*											
Vanadium (fume or dust)	*7440-62-2*	*3.0E+01*	*4/99*				✓				✓	
VANADIUM PENTOXIDE	1314-62-1	3.0E+01	4/99				X				X	

Table 2
OEHHA/ARB APPROVED ACUTE REFERENCE EXPOSURE LEVELS AND TARGET ORGANS

Substance	Chemical[b] Abstract Service Number (CAS)	Acute REL ($\mu g/m^3$)	Date[c] Value Reviewed [Added]	Target Organs[a]								
				Alimentary	Cardiovascular	Reproductive/Development[d]	Eye	Hematologic	Immune	Nervous	Respiratory	Skin
VINYL CHLORIDE[TAC] (Chloroethylene)	75-01-4	1.8E+05	4/99				X			X	X	
XYLENES (mixed isomers)	1330-20-7	2.2E+04	4/99				X			X	X	
m-Xylene	108-38-3	2.2E+04	4/99				X			X	X	
o-Xylene	95-47-6	2.2E+04	4/99				X			X	X	
p-Xylene	106-42-3	2.2E+04	4/99				X			X	X	

Table 3
OEHHA/ARB APPROVED 8-HOUR REFERENCE EXPOSURE LEVELS AND TARGET ORGANS

Substance	Chemical[b] Abstract Number	8-Hour Inhalation REL ($\mu g/m^3$)	Date[c] Value Reviewed [Added]	Target Organs[a]											
				Alimentary	Bone and Teeth	Cardiovascular	Reproductive/[d] Development	Endocrine	Eye	Hematologic	Immune	Kidney	Nervous	Respiratory	Skin
ACETALDEHYDE	75-07-0	3.0E+02	12/08											X	
ACROLEIN	107-02-8	7.0E-01	12/08											X	
ARSENIC AND COMPOUNDS (INORGANIC)[TAC]	7440-38-2 1016 [1015]	1.5E-02	12/08			X	X						X	X	X
Arsenic acid	*7778-39-4*	*1.5E-02*	*12/08 [8/22]*			✓	✓						✓	✓	✓
Arsenic pentoxide	*1303-28-2*	*1.5E-02*	*12/08 [8/22]*			✓	✓						✓	✓	✓
Arsenic trioxide	*1327-53-3*	*1.5E-02*	*12/08 [8/22]*			✓	✓						✓	✓	✓
ARSINE	7784-42-1	1.5E-02	12/08			X	X						X	X	X
Calcium arsenate	*7778-44-1*	*1.5E-02*	*12/08 [8/22]*			✓	✓						✓	✓	✓
Gallium arsenide	*1303-00-0*	*1.5E-02*	*12/08 [8/22]*			✓	✓						✓	✓	✓
BENZENE[TAC]	71-43-2	3.0E+00	6/14							X					
1,3-BUTADIENE[TAC]	106-99-0	9.0E+00	7/13				X								
CAPROLACTAM	105-60-2	7.0E+00	10/13											X	
CARBONYL SULFIDE	463-58-1	1.0E+01	2/17										X		
CHROMIUM (III)	16065-83-1	1.2E-01	8/22											X	
FORMALDEHYDE[TAC]	50-00-0	9.0E+00	12/08											X	
GLYCOL ETHERS	1115														
ETHYLENE GLYCOL BUTYL ETHER – EGBE	111-76-2	1.64E+02	5/18											X	
1,6-HEXAMETHYLENE DIISOCYANATE [i] (monomer)	822-06-0	6.0E-02	9/19											X	
MANGANESE AND COMPOUNDS	7439-96-5 [1132]	1.7E-01	12/08										X		

Table 3
OEHHA/ARB APPROVED 8-HOUR REFERENCE EXPOSURE LEVELS AND TARGET ORGANS

Substance	Chemical[b] Abstract Number	8-Hour Inhalation REL (µg/m³)	Date[c] Value Reviewed [Added]	Target Organs[a]											
				Alimentary	Bone and Teeth	Cardiovascular	Reproductive/[d] Development	Endocrine	Eye	Hematologic	Immune	Kidney	Nervous	Respiratory	Skin
Manganese cyclopentadienyl tricarbonyl	12079-65-1	1.7E-01	12/08 [8/22]										✓		
2-Methylcyclopentadienyl manganese tricarbonyl	12108-13-3	1.7E-01	12/08 [8/22]										✓		
MERCURY AND COMPOUNDS (INORGANIC)	7439-97-6 [1133]	6.0E-02	12/08				X					X	X		
Mercuric chloride	*7487-94-7*	*6.0E-02*	*12/08*				✓					✓	✓		
METHYLENE DIPHENYL DIISOCYANATE	101-68-8	1.6E-01	3/16											X	
NICKEL AND COMPOUNDS[TAC]	7440-02-0 [1145]	6.0E-02	3/12								X			X	
Nickel acetate	*373-02-4*	*6.0E-02*	*3/12*								✓			✓	
Nickel carbonate	*3333-67-3*	*6.0E-02*	*3/12*								✓			✓	
Nickel carbonyl	*13463-39-3*	*6.0E-02*	*3/12*								✓			✓	
Nickel chloride	*7718-54-9*	*6.0E-02*	*3/12 [8/22]*								✓			✓	
Nickel hydroxide	*12054-48-7*	*6.0E-02*	*3/12*								✓			✓	
Nickel nitrate {Nickel (II) nitrate}	*13138-45-9*	*6.0E-02*	*3/12 [8/22]*								✓			✓	
Nickelocene	*1271-28-9*	*6.0E-02*	*3/12*								✓			✓	
NICKEL OXIDE	*1313-99-1*	*6.0E-02*	*3/12*								✓			✓	
Nickel refinery dust from the pyrometallurgical process	*1146*	*6.0E-02*	*3/12*								✓			✓	
Nickel subsulfide	*12035-72-2*	*6.0E-02*	*3/12*								✓			✓	
Nickel sulfate	*7786-81-4*	*6.0E-02*	*3/12 [8/22]*								✓			✓	
POLYMERIC (OLIGO) HEXAMETHYLENE-1,6-DIISOCYANATE (HDI)	1221	8.0E-01	9/19 [8/22]											X	
BIURET	108-19-0	8.0E-01	9/19 [8/22]											X	
DIISOCYANURATE	1226	8.0E-01	9/19 [8/22]											X	
HDI PREPOLYMER	1227	8.0E-01	9/19 [8/22]											X	
ISOCYANURATE	1228	8.0E-01	9/19 [8/22]											X	

Table 3
OEHHA/ARB APPROVED 8-HOUR REFERENCE EXPOSURE LEVELS AND TARGET ORGANS

Substance	Chemical[b] Abstract Number	8-Hour Inhalation REL ($\mu g/m^3$)	Date[c] Value Reviewed [Added]	Target Organs[a]											
				Alimentary	Bone and Teeth	Cardiovascular	Reproductive/[d] Development	Endocrine	Eye	Hematologic	Immune	Kidney	Nervous	Respiratory	Skin
URETDIONE (HDI) {URETIDONE}	23501-81-7	8.0E-01	9/19 [8/22]											X	
TOLUENE	108-88-3	8.3E+02	8/20						X						
Toluene diisocyanates	*26471-62-5*	*1.5E-02*	*3/16*											✓	
TOLUENE-2,4-DIISOCYANATE	584-84-9	1.5E-02	3/16											X	
TOLUENE-2,6-DIISOCYANATE	91-08-7	1.5E-02	3/16											X	

Table 4
OEHHA/ARB APPROVED CHRONIC REFERENCE EXPOSURE LEVELS AND TARGET ORGANS

Substance	Chemical[b] Abstract Number	Chronic Inhalation REL ($\mu g/m^3$)	Chronic Oral REL (mg/kg-d)	Date[c] Value Reviewed [Added]	Target Organs[a]											
					Alimentary	Bone and Teeth	Cardiovascular	Reproductive/[d] Development	Endocrine	Eye	Hematologic	Immune	Kidney	Nervous	Respiratory	Skin
ACETALDEHYDE	75-07-0	1.4E+02		12/08											X	
ACROLEIN	107-02-8	3.5E-01		12/08											X	
ACRYLONITRILE	107-13-1	5.0E+00		12/01											X	
AMMONIA	7664-41-7	2.0E+02		2/00											X	
ARSENIC AND COMPOUNDS (INORGANIC)[TAC]	7440-38-2 1016 [1015]	1.5E-02		12/08			X	X						X	X	X
			3.5E-06	12/08			X	X						X	X	X
Arsenic acid	*7778-39-4*	*1.5E-02*		*12/08 [8/22]*			✓	✓						✓	✓	✓
			3.5E-06	*12/08 [8/22]*			✓	✓						✓	✓	✓
Arsenic pentoxide	*1303-28-2*	*1.5E-02*		*12/08 [8/22]*			✓	✓						✓	✓	✓
			3.5E-06	*12/08 [8/22]*			✓	✓						✓	✓	✓
Arsenic trioxide	*1327-53-3*	*1.5E-02*		*12/08 [8/22]*			✓	✓						✓	✓	✓
			3.5E-06	*12/08 [8/22]*			✓	✓						✓	✓	✓
ARSINE	7784-42-1	1.5E-02	NA	12/08			X	X						X	X	X
Calcium arsenate	7778-44-1	*1.5E-02*		*12/08 [8/22]*			✓	✓						✓	✓	✓
			3.5E-06	*12/08 [8/22]*			✓	✓						✓	✓	✓
Gallium arsenide	1303-00-0	*1.5E-02*		*12/08 [8/22]*			✓	✓						✓	✓	✓
			3.5E-06	*12/08 [8/22]*			✓	✓						✓	✓	✓
BENZENE[TAC]	71-43-2	3.0E+00		6/14							X					
BERYLLIUM AND COMPOUNDS	7440-41-7 [1021]	7.0E-03		12/01								X			X	
			2.0E-03	12/01	X											
Beryllium sulfate	*13510-49-1*	*7.0E-03*		*12/01 [8/22]*								✓			✓	
			2.0E-03	*12/01 [8/22]*	✓											
Beryllium sulfate (tetrahydrate)	*7787-56-6*	*7.0E-03*		*12/01 [8/22]*								✓			✓	
			2.0E-03	*12/01 [8/22]*	✓											
Beryllium oxide	*1304-56-9*	*7.0E-03*		*12/01 [8/22]*								✓			✓	
			2.0E-03	*12/01 [8/22]*	✓											
1,3-BUTADIENE[TAC]	106-99-0	2.0E+00		7/13				X								

Table 4
OEHHA/ARB APPROVED CHRONIC REFERENCE EXPOSURE LEVELS AND TARGET ORGANS

Substance	Chemical[b] Abstract Number	Chronic Inhalation REL ($\mu g/m^3$)	Chronic Oral REL (mg/kg-d)	Date[c] Value Reviewed [Added]	Target Organs[a]											
					Alimentary	Bone and Teeth	Cardiovascular	Reproductive/[d] Development	Endocrine	Eye	Hematologic	Immune	Kidney	Nervous	Respiratory	Skin
CADMIUM AND COMPOUNDS[TAC]	7440-43-9 [1045]	2.0E-02		1/01									X		X	
			5.0E-04	10/00									X			
Cadmium chloride	*10108-64-2*	*2.0E-02*		*10/00 [8/22]*									✓		✓	
			5.0E-04	*10/00 [8/22]*									✓			
Cadmium succinate	*141-00-4*	*2.0E-02*		*10/00 [8/22]*									✓		✓	
			5.0E-04	*10/00 [8/22]*									✓			
CAPROLACTAM	105-60-2	2.2E+00		10/13											X	
CARBON DISULFIDE	75-15-0	8.0E+02		5/02				X						X		
CARBON TETRACHLORIDE[TAC] (Tetrachloromethane)	56-23-5	4.0E+01		1/01	X			X						X		
CARBONYL SULFIDE	463-58-1	1.0E+01		2/17										X		
CHLORINE	7782-50-5	2.0E-01		2/00											X	
CHLORINE DIOXIDE	10049-04-4	6.0E-01		1/01											X	
CHLOROBENZENE	108-90-7	1.0E+03		1/01	X			X					X			
CHLOROFORM[TAC]	67-66-3	3.0E+02		4/00	X			X					X			
CHLOROPICRIN	76-06-2	4.0E-01		12/01											X	
CHROMIUM (III)	16065-83-1	6.0E-02		8/22											X	
CHROMIUM 6+[TAC]	18540-29-9	2.0E-01		1/01											X	
			2.0E-02	10/00							X					
Barium chromate	*10294-40-3*	*2.0E-01*		*1/01*											✓	
			2.0E-02	*10/00*							✓					
t-Butyl chromate (VI)	*1189-85-1*	*2.0E-01*		*1/01 [8/22]*											✓	
			2.0E-02	*10/00 [8/22]*							✓					
Calcium chromate	*13765-19-0*	*2.0E-01*		*1/01*											✓	
			2.0E-02	*10/00*							✓					
Lead chromate	*7758-97-6*	*2.0E-01*		*1/01*											✓	
			2.0E-02	*10/00*							✓					

Table 4
OEHHA/ARB APPROVED CHRONIC REFERENCE EXPOSURE LEVELS AND TARGET ORGANS

Substance	Chemical[b] Abstract Number	Chronic Inhalation REL ($\mu g/m^3$)	Chronic Oral REL (mg/kg-d)	Date[c] Value Reviewed [Added]	Target Organs[a]											
					Alimentary	Bone and Teeth	Cardiovascular	Reproductive/[d] Development	Endocrine	Eye	Hematologic	Immune	Kidney	Nervous	Respiratory	Skin
Sodium dichromate	*10588-01-9*	*2.0E-01*		*1/01*											✓	
			2.0E-02	*10/00*							✓					
Strontium chromate	*7789-06-2*	*2.0E-01*		*1/01*											✓	
			2.0E-02	*10/00*							✓					
CHROMIUM TRIOXIDE (as chromic acid mist)	1333-82-0	2.0E-03		1/01											X	
			2.0E-02	*10/00*							✓					
CRESOLS (mixtures of)	1319-77-3	6.0E+02		1/01										X		
m-CRESOL	108-39-4	6.0E+02		1/01										X		
o-CRESOL	95-48-7	6.0E+02		1/01										X		
p-CRESOL	106-44-5	6.0E+02		1/01										X		
Cyanide Compounds (inorganic)	*57-12-5 1073*	*9.0E+00*		*4/00*			✓		✓					✓		
Calcium cyanide	*592-01-8*	*9.0E+00*		*4/00 [8/22]*			✓		✓					✓		
HYDROGEN CYANIDE (Hydrocyanic acid)	74-90-8 341972-31-4 191234-22-7	9.0E+00		4/00			X		X					X		
Potassium cyanide	*151-50-8*	*9.0E+00*		*4/00 [8/22]*			✓		✓					✓		
Sodium cyanide	*143-33-9*	*9.0E+00*		*4/00 [8/22]*			✓		✓					✓		
p-DICHLOROBENZENE	106-46-7	8.0E+02		1/01	X								X	X	X	
1,1,-DICHLOROETHYLENE … (see Vinylidene Chloride)																
DIESEL EXHAUST … (see Particulate Emissions from Diesel-Fueled Engines)																
DIETHANOLAMINE	111-42-2	3.0E+00		12/01							X				X	
N,N-DIMETHYL FORMAMIDE	68-12-2	8.0E+01		1/01	X										X	
1,4-DIOXANE; (1,4-Diethylene dioxide)	123-91-1	3.0E+03		4/00	X		X						X			
EPICHLOROHYDRIN (1-Chloro-2,3-epoxypropane)	106-89-8	3.0E+00		1/01						X					X	
1,2-EPOXYBUTANE	106-88-7	2.0E+01		1/01			X								X	

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Substance	Chemical[b] Abstract Number	Chronic Inhalation REL ($\mu g/m^3$)	Chronic Oral REL (mg/kg-d)	Date[c] Value Reviewed [Added]	Target Organs[a]											
					Alimentary	Bone and Teeth	Cardiovascular	Reproductive/[d] Development	Endocrine	Eye	Hematologic	Immune	Kidney	Nervous	Respiratory	Skin
ETHYL BENZENE	100-41-4	2.0E+03		2/00	X			X	X				X			
ETHYL CHLORIDE (Chlorethane)	75-00-3	3.0E+04		4/00	X			X								
ETHYLENE DIBROMIDE[TAC] (1,2-Dibromoethane)	106-93-4	8.0E-01		12/01				X								
ETHYLENE DICHLORIDE[TAC] (1,2-Dichloroethane)	107-06-2	4.0E+02		1/01	X											
ETHYLENE GLYCOL	107-21-1	4.0E+02		4/00				X					X		X	
ETHYLENE OXIDE[TAC] (1,2-Epoxyethane)	75-21-8	3.0E+01		1/01										X		
FLUORIDES AND COMPOUNDS	1101	1.3E+01		8/03		X									X	
			4.0E-02	8/03		X										
HYDROGEN FLUORIDE (Hydrofluoric acid)	7664-39-3	1.4E+01		8/03		X									X	
			4.0E-02	8/03		X										
Modified Hydrogen fluoride {MHF}	*1141*	*1.4E+01*		*8/03 [8/22]*		✓									✓	
			4.0E-02	*8/03 [8/22]*		✓										
Selenium hexafluoride	*7664-39-3*	*1.4E+01*		*8/03 [8/22]*		✓									✓	
			4.0E-02	*8/03 [8/22]*		✓										
Sodium aluminum fluoride	*15096-52-3*	*1.4E+01*		*8/03 [8/22]*		✓									✓	
			4.0E-02	*8/03 [8/22]*		✓										
Sodium fluoride	*7681-49-4*	*1.4E+01*		*8/03 [8/22]*		✓									✓	
			4.0E-02	*8/03 [8/22]*		✓										
FORMALDEHYDE[TAC]	50-00-0	9.0E+00		12/08											X	
GLUTARALDEHYDE	111-30-8	8.0E-02		1/01											X	
GLYCOL ETHERS	1115															
ETHYLENE GLYCOL BUTYL ETHER – EGBE	111-76-2	8.2E+01		5/18											X	
ETHYLENE GLYCOL ETHYL ETHER – EGEE	110-80-5	7.0E+01		2/00				X			X					
ETHYLENE GLYCOL ETHYL ETHER ACETATE - EGEEA	111-15-9	3.0E+02		2/00				X								
ETHYLENE GLYCOL METHYL ETHER – EGME	109-86-4	6.0E+01		2/00				X								

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Substance	Chemical[b] Abstract Number	Chronic Inhalation REL ($\mu g/m^3$)	Chronic Oral REL (mg/kg-d)	Date[c] Value Reviewed [Added]	Target Organs[a]											
					Alimentary	Bone and Teeth	Cardiovascular	Reproductive/[d] Development	Endocrine	Eye	Hematologic	Immune	Kidney	Nervous	Respiratory	Skin
ETHYLENE GLYCOL METHYL ETHER ACETATE - EGMEA	110-49-6	9.0E+01		2/00				X								
1,6-HEXAMETHYLENE DIISOCYANATE [i] (monomer)	822-06-0	3.0E-02		9/19											X	
n-HEXANE	110-54-3	7.0E+03		4/00										X		
HYDRAZINE	302-01-2	2.0E-01		1/01	X				X							
HYDROCHLORIC ACID (Hydrogen chloride)	7647-01-0	9.0E+00		2/00											X	
HYDROGEN CYANIDE (Hydrocyanic acid) (see Cyanide Compounds)																
HYDROGEN BROMIDE ... (see Bromine & Compounds)																
HYDROGEN FLUORIDE (Hydrofluoric acid) (see Fluorides & Compounds)																
HYDROGEN SULFIDE	7783-06-4	1.0E+01		4/00											X	
ISOPHORONE	78-59-1	2.0E+03		12/01	X			X								
ISOPROPYL ALCOHOL (Isopropanol)	67-63-0	7.0E+03		2/00				X					X			
LINDANE ... (see gamma-Hexachlorocyclohexane)																
MALEIC ANHYDRIDE	108-31-6	7.0E-01		12/01											X	
MANGANESE AND COMPOUNDS	7439-96-5 [1132]	9.0E-02		12/08										X		
Manganese cyclopentadienyl tricarbonyl	*12079-65-1*	*9.0E-02*		*12/08 [8/22]*										✓		
2-Methylcyclopentadienyl manganese tricarbonyl	*12108-13-3*	*9.0E-02*		*12/08 [8/22]*										✓		
MERCURY AND INORGANIC COMPOUNDS	7439-97-6 [1133]	3.0E-02		12/08				X					X	X		
			1.6E-04	12/08				X					X	X		
Mercuric chloride	*7487-94-7*	*3.0E-02*		*12/08*				✓					✓	✓		
			1.6E-04	*12/08*				✓					✓	✓		
METHANOL	67-56-1	4.0E+03		4/00				X								
METHYL BROMIDE (Bromomethane)	74-83-9	5.0E+00		2/00				X						X	X	

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					Alimentary	Bone and Teeth	Cardiovascular	Reproductive/[d] Development	Endocrine	Eye	Hematologic	Immune	Kidney	Nervous	Respiratory	Skin
METHYL tertiary-BUTYL ETHER	1634-04-4	8.0E+03		2/00	X					X			X			
METHYL CHLOROFORM (1,1,1-Trichloroethane)	71-55-6	1.0E+03		2/00										X		
METHYL ISOCYANATE	624-83-9	1.0E+00		12/01				X							X	
METHYLENE CHLORIDE[TAC] (Dichloromethane)	75-09-2	4.0E+02		2/00			X							X		
4,4'-METHYLENE DIANILINE (AND ITS DICHLORIDE)	101-77-9	2.0E+01		12/01	X					X						
METHYLENE DIPHENYL DIISOCYANATE	101-68-8	8.0E-02		3/16											X	
NAPHTHALENE	91-20-3	9.0E+00		4/00											X	
NICKEL AND COMPOUNDS[TAC]	7440-02-0 [1145]	1.4E-02		3/12							X				X	
			1.1E-02	3/12				X								
Nickel acetate	*373-02-4*	*1.4E-02*		*3/12*							✓				✓	
			1.1E-02	*3/12*				✓								
Nickel carbonate	*3333-67-3*	*1.4E-02*		*3/12*							✓				✓	
			1.1E-02	*3/12*				✓								
Nickel carbonyl	*13463-39-3*	*1.4E-02*		*3/12*							✓				✓	
			1.1E-02	*3/12*				✓								
Nickel chloride	*7718-54-9*	*1.4E-02*		*3/12 [8/22]*							✓				✓	
			1.1E-02	*3/12 [8/22]*				✓								
Nickel hydroxide	*12054-48-7*	*1.4E-02*		*3/12*							✓				✓	
			1.1E-02	*3/12*				✓								
Nickelocene	*1271-28-9*	*1.4E-02*		*3/12*							✓				✓	
			1.1E-02	*3/12*				✓								
Nickel nitrate {Nickel (II) nitrate}	*13138-45-9*	*1.4E-02*		*3/12 [8/22]*							✓				✓	
			1.1E-02	*3/12 [8/22]*				✓								

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					Alimentary	Bone and Teeth	Cardiovascular	Reproductive/[d] Development	Endocrine	Eye	Hematologic	Immune	Kidney	Nervous	Respiratory	Skin
NICKEL OXIDE	1313-99-1	2.0E-02		3/12											X	
			1.1E-02	*3/12*				✓								
Nickel refinery dust from pyrometallurgical process	*1146*	*1.4E-02*		*3/12*							✓				✓	
			1.1E-02	*3/12*				✓								
Nickel subsulfide	*12035-72-2*	*1.4E-02*		*3/12*							✓				✓	
			1.1E-02	*3/12*				✓								
Nickel sulfate	*7786-81-4*	*1.4E-02*		*3/12 [8/22]*							✓				✓	
			1.1E-02	*3/12 [8/22]*				✓								
PARTICULATE EMISSIONS FROM DIESEL-FUELED ENGINES[TAC, e]	9901	5.0E+00 TAC		8/98											X	
PERCHLOROETHYLENE[TAC] (Tetrachloroethylene)	127-18-4	3.5E+01 TAC		10/91	X								X			
PHENOL	108-95-2	2.0E+02		4/00	X		X						X	X		
PHOSPHINE	7803-51-2	8.0E-01		9/02	X						X		X	X	X	
PHOSPHORIC ACID	7664-38-2	7.0E+00		2/00											X	
PHTHALIC ANHYDRIDE	85-44-9	2.0E+01		1/01											X	
DIOXIN-LIKE POLYCHLORINATED BIPHENYLS (PCBS)[f,]	1336-36-3															
3,3',4,4'-TETRACHLOROBIPHENYL (PCB 77)	32598-13-3	4.0E-01		8/03	X			X	X		X				X	
			1.0E-04	8/03	X			X	X		X				X	
3,4,4',5-TETRACHLOROBIPHENYL (PCB 81)	70362-50-4	1.3E-01		1/11	X			X	X		X				X	
			3.3E-05	1/11	X			X	X		X				X	
2,3,3',4,4'-PENTACHLOROBIPHENYL (PCB 105)	32598-14-4	1.3E+00		1/11	X			X	X		X				X	
			3.3E-04	1/11	X			X	X		X				X	
2,3,4,4',5-PENTACHLOROBIPHENYL (PCB 114)	74472-37-0	1.3E+00		1/11	X			X	X		X				X	
			3.3E-04	1/11	X			X	X		X				X	

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Substance	Chemical[b] Abstract Number	Chronic Inhalation REL ($\mu g/m^3$)	Chronic Oral REL (mg/kg-d)	Date[c] Value Reviewed [Added]	Target Organs[a]											
					Alimentary	Bone and Teeth	Cardiovascular	Reproductive/[d] Development	Endocrine	Eye	Hematologic	Immune	Kidney	Nervous	Respiratory	Skin
2,3',4,4',5-PENTACHLOROBIPHENYL (PCB 118)	31508-00-6	1.3E+00		1/11	X			X	X		X				X	
			3.3E-04	1/11	X			X	X		X				X	
2,3',4,4',5'-PENTACHLOROBIPHENYL (PCB 123)	65510-44-3	1.3E+00		1/11	X			X	X		X				X	
			3.3E-04	1/11	X			X	X		X				X	
3,3',4,4',5-PENTACHLOROBIPHENYL (PCB 126)	57465-28-8	4.0E-04		8/03	X			X	X		X				X	
			1.0E-07	8/03	X			X	X		X				X	
2,3,3',4,4',5-HEXACHLOROBIPHENYL (PCB 156)	38380-08-4	1.3E+00		1/11	X			X	X		X				X	
			3.3E-04	1/11	X			X	X		X				X	
2,3,3',4,4',5'-HEXACHLOROBIPHENYL (PCB 157)	69782-90-7	1.3E+00		1/11	X			X	X		X				X	
			3.3E-04	1/11	X			X	X		X				X	
2,3',4,4',5,5'-HEXACHLOROBIPHENYL (PCB 167)	52663-72-6	1.3E+00		1/11	X			X	X		X				X	
			3.3E-04	1/11	X			X	X		X				X	
3,3',4,4',5,5'-HEXACHLOROBIPHENYL (PCB 169)	32774-16-6	1.3E-03		1/11	X			X	X		X				X	
			3.3E-07	1/11	X			X	X		X				X	
2,3,3',4,4',5,5'-HEPTACHLOROBIPHENYL (PCB 189)	39635-31-9	1.3E+00		1/11	X			X	X		X				X	
			3.3E-04	1/11	X			X	X		X				X	
POLYCHLORINATED DIBENZO-P-DIOXINS (PCDD) (Treated as 2,3,7,8-TCDD for HRA)[TAC, f]	1085 1086	4.0E-05		2/00	X			X	X		X				X	
			1.0E-08	10/00	X			X	X		X				X	
2,3,7,8-TETRACHLORODIBENZO-P-DIOXIN[TAC]	1746-01-6	4.0E-05		2/00	X			X	X		X				X	
			1.0E-08	10/00	X			X	X		X				X	
1,2,3,7,8-PENTACHLORODIBENZO-P-DIOXIN	40321-76-4	4.0E-05		8/03	X			X	X		X				X	
			1.0E-08	8/03	X			X	X		X				X	
1,2,3,4,7,8-HEXACHLORODIBENZO-P-DIOXIN	39227-28-6	4.0E-04		2/00	X			X	X		X				X	
			1.0E-07	10/00	X			X	X		X				X	
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	57653-85-7	4.0E-04		2/00	X			X	X		X				X	
			1.0E-07	10/00	X			X	X		X				X	

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					Alimentary	Bone and Teeth	Cardiovascular	Reproductive/[d] Development	Endocrine	Eye	Hematologic	Immune	Kidney	Nervous	Respiratory	Skin
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	19408-74-3	4.0E-04		2/00	X			X	X		X				X	
			1.0E-07	10/00	X			X	X		X				X	
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-P-DIOXIN	35822-46-9	4.0E-03		2/00	X			X	X		X				X	
			1.0E-06	10/00	X			X	X		X				X	
1,2,3,4,6,7,8,9-OCTACHLORODIBENZO-P-DIOXIN	3268-87-9	1.3E-01		1/11	X			X	X		X				X	
			3.3E-05	1/11	X			X	X		X				X	
POLYCHLORINATED DIBENZOFURANS (PCDF) (Treated as 2,3,7,8-TCDD for HRA) [TAC, f]	1080	4.0E-05		2/00	X			X	X		X				X	
			1.0E-08	10/00	X			X	X		X				X	
2,3,7,8-TETRACHLORODIBENZOFURAN	5120-73-19	4.0E-04		2/00	X			X	X		X				X	
			1.0E-07	10/00	X			X	X		X				X	
1,2,3,7,8-PENTACHLORODIBENZOFURAN	57117-41-6	1.3E-03		1/11	X			X	X		X				X	
			3.3E-07	1/11	X			X	X		X				X	
2,3,4,7,8-PENTACHLORODIBENZOFURN	57117-31-4	1.3E-04		1/11	X			X	X		X				X	
			3.3E-08	1/11	X			X	X		X				X	
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	70648-26-9	4.0E-04		2/00	X			X	X		X				X	
			1.0E-07	10/00	X			X	X		X				X	
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	57117-44-9	4.0E-04		2/00	X			X	X		X				X	
			1.0E-07	10/00	X			X	X		X				X	
1,2,3,7,8,9-HEXACHLORODIBENZOFURAN	72918-21-9	4.0E-04		2/00	X			X	X		X				X	
			1.0E-07	10/00	X			X	X		X				X	
2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	60851-34-5	4.0E-04		2/00	X			X	X		X				X	
			1.0E-07	10/00	X			X	X		X				X	

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OEHHA/ARB APPROVED CHRONIC REFERENCE EXPOSURE LEVELS AND TARGET ORGANS

Substance	Chemical[b] Abstract Number	Chronic Inhalation REL ($\mu g/m^3$)	Chronic Oral REL (mg/kg-d)	Date[c] Value Reviewed [Added]	Target Organs[a]											
					Alimentary	Bone and Teeth	Cardiovascular	Reproductive/[d] Development	Endocrine	Eye	Hematologic	Immune	Kidney	Nervous	Respiratory	Skin
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	67562-39-4	4.0E-03		2/00	X			X	X		X				X	
			1.0E-06	10/00	X			X	X		X				X	
1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	55673-89-7	4.0E-03		2/00	X			X	X		X				X	
			1.0E-06	10/00	X			X	X		X				X	
1,2,3,4,6,7,8,9-OCTACHLORODIBENZOFURAN	39001-02-0	1.3E-01		1/11	X			X	X		X				X	
			3.3E-05	1/11	X			X	X		X				X	
POLYMERIC (OLIGO) HEXAMETHYLENE-1,6-DIISOCYANATE (HDI)	1221	4.0E-01		9/19 [8/22]											X	
BIURET	108-19-0	4.0E-01		9/19 [8/22]											X	
DIISOCYANURATE	1226	4.0E-01		9/19 [8/22]											X	
HDI PREPOLYMER	1227	4.0E-01		9/19 [8/22]											X	
ISOCYANURATE	1228	4.0E-01		9/19 [8/22]											X	
URETDIONE (HDI) {URETIDONE}	23501-81-7	4.0E-01		9/19 [8/22]											X	
POTASSIUM BROMATE ... (see Bromine & Compounds)																
PROPYLENE (PROPENE)	115-07-1	3.0E+03		4/00											X	
PROPYLENE GLYCOL MONOMETHYL ETHER	107-98-2	7.0E+03		2/00	X											
PROPYLENE OXIDE	75-56-9	3.0E+01		2/00											X	

Table 4
OEHHA/ARB APPROVED CHRONIC REFERENCE EXPOSURE LEVELS AND TARGET ORGANS

Substance	Chemical[b] Abstract Number	Chronic Inhalation REL ($\mu g/m^3$)	Chronic Oral REL (mg/kg-d)	Date[c] Value Reviewed [Added]	Target Organs[a]											
					Alimentary	Bone and Teeth	Cardiovascular	Reproductive/[d] Development	Endocrine	Eye	Hematologic	Immune	Kidney	Nervous	Respiratory	Skin
SELENIUM AND COMPOUNDS (other than hydrogen selenide)[h]	7782-49-2 [1170]	2.0E+01		12/01	X		X							X		
			5.0E-03	12/01	X		X							X		
Selenium sulfide	*7446-34-6*	*2.0E+01*		*12/01*	✓		✓							✓		
			5.0E-03	*12/01*	✓		✓							✓		
Selenium hexafluoride see Fluorides and Compounds																
SILICA [CRYSTALLINE, RESPIRABLE]	1175	3.0E+00		2/05											X	
Silica, crystalline (respirable), in the form of cristobalite	*14464-46-1*	*3.0E+00*		*2/05 [8/22]*											✓	
Silica, crystalline (respirable), in the form of quartz	*14808-60-7*	*3.0E+00*		*2/05 [8/22]*											✓	
STYRENE	100-42-5	9.0E+02		4/00										X		
Sulfuric Acid	7664-93-9	1.0E+00		12/01											X	
Sulfuric Trioxide	*7446-71-9*	*1.0E+00*		*12/01*											✓	
TOLUENE	108-88-3	4.2E+02		8/20						X						
Toluene diisocyanates	*26471-62-5*	*8.0E-03*		*3/16*											✓	
TOLUENE-2,4-DIISOCYANATE	584-84-9	8.0E-03		3/16											X	
TOLUENE-2,6-DIISOCYANATE	91-08-7	8.0E-03		3/16											X	
TRICHLOROETHYLENE[TAC]	79-01-6	6.0E+02		4/00						X				X		
TRIETHYLAMINE	121-44-8	2.0E+02		9/02						X						
VINYL ACETATE	108-05-4	2.0E+02		12/01											X	
VINYLIDENE CHLORIDE (1,1,-Dichloroethylene)	75-35-4	7.0E+01		1/01	X											
XYLENES (mixed isomers)	1330-20-7	7.0E+02		4/00						X				X	X	
m-XYLENE	108-38-3	7.0E+02		4/00						X				X	X	
o-XYLENE	95-47-6	7.0E+02		4/00						X				X	X	
p-XYLENE	106-42-3	7.0E+02		4/00						X				X	X	

Footnotes
ACUTE, 8-HOUR, AND CHRONIC REFERENCE EXPOSURE LEVELS AND TARGET ORGANS

Purpose:	The purpose of these reference tables is to provide a quick list of all health values that have been approved by the Office of Environmental Health Hazard Assessment (OEHHA) and the Air Resources Board (ARB) for use in facility health risk assessments conducted for the AB 2588 Air Toxics "Hot Spots" Program. The OEHHA has developed and adopted new risk assessment guidelines that update and replace the California Air Pollution Control Officers Association's (CAPCOA) *Air Toxics "Hot Spots" Program Revised 1992 Risk Assessment Guidelines, October 1993*. The OEHHA has adopted technical support documents for these guidelines, which can be found on their website (https://oehha.ca.gov/air/air-toxics-hot-spots). OEHHA is still in the process of adopting new health values. Therefore, new health values will periodically be added to, or deleted from, these tables. Users of this table are advised to monitor the OEHHA website (*https://oehha.ca.gov/*) for any updates to the health values. 8-Hour RELs: The methodology for the development and use of 8-hour RELs in Health Risk Assessments can be found in the OEHHA 2008 document Air Toxics Hot Spots Program Technical Support Document for the Derivation of Noncancer Reference Exposure Levels online at: http://oehha.ca.gov/air/hot_spots/rels_dec2008.html. OEHHA is still in the process of adopting new health values. Therefore, new health values will periodically be added to, or deleted from, this table. Users of this table are advised to monitor the OEHHA website (www.oehha.ca.gov) for any updates to the health values. May 2008 update: The Air Resources Board adopted amendments to the AB 2588 Air Toxics "Hot Spots" Emission Inventory Criteria and Guidelines Regulation (Title 17, California Code of Regulations, Section 93300.5) on November 16, 2006. The amendments became effective on September 26, 2007, after approval from the Office of Administrative Law. Under the new amendments, the substances previously listed in Appendix A-I *(Substances for Which Emissions Must Be Quantified*) and Appendix F (*Criteria for Inputs For Risk Assessment Using Screening Air Dispersion Modeling*) of the ARB's *Air Toxics* "*Hot Spots" Emission Inventory Criteria and Guidelines (EICG) (July 1997)* have been removed from this table. September 2022 update: The Air Resources Board adopted amendments to the AB 2588 Air Toxics "Hot Spots" Emission Inventory Criteria and Guidelines Regulation (Title 17, California Code of Regulations, Section 93300.5) on November 19, 2020. The amendments became effective on March 21, 2022, after approval from the Office of Administrative Law. Under the new amendments a number of pollutants were added to Appendix A-1: Substances for Which Emissions Must be Quantified. OEHHA was consulted to determine which existing health values may be applied to these new pollutants. OEHHA applied health values to 61 pollutants. OEHHA also helped determine the appropriate MWAF, if applicable. NOTE ON REPORTING UNDER HOT SPOTS PROGRAM: New chemicals that are reported by a facility due to being covered by one of the chemical "functional group" definitions, which are shown at the end of EICG Appendix A-I (i.e., the functional groups related to isocyanates, halogenated PAHs, and certain types of per/poly fluorinated compounds), should be discussed with CARB and/or OEHHA to determine whether an OEHHA health value may apply to them.
a	The checkmarks ✔ included in this table clarify applicability of OEHHA adopted health effects values to individual or grouped substances listed in the *Air Toxics* "*Hot Spots" Emission Inventory Criteria and Guidelines*, Appendix A-I list of *"Substances for Which Emissions Must Be Quantified"*.
b	Chemical Abstract Service Number (CAS): For chemical groupings and mixtures where a CAS number is not applicable, the 4-digit code used in the *Air Toxics* "*Hot Spots" Emission Inventory Criteria and Guidelines (EICG) Report* is listed. The 4-digit codes enclosed in brackets [ ] are codes that have been phased out, but may still appear on previously reported Hot Spots emissions. For information on the origin and use of the 4-digit code, see the EICG report.

Footnotes
ACUTE, 8-HOUR, AND CHRONIC REFERENCE EXPOSURE LEVELS AND TARGET ORGANS

C Date Value Reviewed [Added]: This column lists the date that the health value was last reviewed by OEHHA and the Scientific Review Panel, and/or approved for use in the AB 2588 Air Toxics Hot Spots Program. If the health value is unchanged since it was first approved for use in the "Hot Spots" Program, then the date that the value was first approved for use by CAPCOA is listed within the brackets [ ].

- April 1999 is listed for the noncancer acute RELs which have been adopted by the OEHHA as part of the AB 2588 Hot Spot Risk Assessment Guidelines.
- February 2000, April 2000, January 2001, and December 2001 are listed for the first set of 22, the second set of 16, the third set of 22, and the fourth set of 12 noncancer chronic RELs, respectively. The chronic REL for carbon disulfide was adopted in May 2002. Chronic RELs for phosphine and triethylamine were adopted in September 2002. Chronic RELs for fluorides including hydrogen fluoride were adopted August 2003. Chronic REL for silica [crystalline respirable] was adopted February 2005.
- October 2000 is listed for the oral chronic RELs.
- For the substances identified as Toxic Air Contaminants, the Air Resources Board hearing date is listed. The date for acetaldehyde represents the date the value was approved by the Scientific Review Panel.
- On December 19, 2008:
  - OEHHA adopted new acute, 8-hour, and chronic RELs for acetaldehyde, acrolein, arsenic, formaldehyde, and mercury. The most current health values can be found at: http://www.oehha.ca.gov/air/allrels.html.
  - All acute RELs use a 1-hour averaging period (OEHHA, 2008). RELs which were developed using earlier guidelines and specified a different averaging time are unchanged in concentration value, but now refer to the 1-hour averaging period. As of 8/1/2013, the affected chemicals are: benzene, carbon disulfide, carbon tetrachloride, chloroform, ethylene glycol monoethyl ether, ethylene glycol monoethyl ether acetate, and ethylene glycol monomethyl ether: These may be replaced by updated RELs following the OEHHA (2008) guidelines in due course.
  - We present the new chronic oral RELs only in milligrams (mg/kg-d), although OEHHA has presented chronic oral RELs in other tables in either micrograms (μg/kg-d) or mg/kg-d.
  - At OEHHA's direction, the chronic oral REL for arsenic does not apply to arsine, because arsine is a gas and not particle associated.
  - Note that the 8-hour RELs were not included in the HARP software at this date. These health factors were added to the HARP software when OEHHA adopted Air Toxics Hot Spots Program Guidance Manual for the Preparation of Health Risk Assessments in March 2015
- January 2011 is listed to reflect OEHHA's adoption of the World Health Organization's 2005 Toxicity Equivalency Factors for polychlorinated dibenzo-p-dioxins (PCDDs), dibenzofurans (PCDFs), and dioxin-like polychlorinated biphenyls (PCBs). See Appendix C of OEHHA's Air Toxics Hot Spots Program Technical Support Document for Cancer Potencies at: https://oehha.ca.gov/air/crnr/technical-support-document-cancer-potency-factors-2009 for more information.
- On March 23, 2012, OEHHA adopted revised acute, 8-hour and chronic RELs for nickel and nickel compounds. The values of the RELs are listed in the table at: http://www.oehha.ca.gov/air/chronic_rels/032312CREL.html.
- On July 29, 2013, OEHHA adopted an acute and an 8-hour REL and a revised chronic REL for 1,3-butadiene. The REL value and summary can be found online at: https://oehha.ca.gov/media/downloads/crnr/072613bentcrel.pdf.
- On October 18, 2013 (February 2014 table update):
  - OEHHA adopted acute, 8-hour, and chronic RELs for caprolactam. The REL values and summary can be found at: https://oehha.ca.gov/media/downloads/crnr/caprolactam2013.pdf.
  - Changes have been made to acute target organs to the following substances with no change to health factors: Chloroform, Methylene Chloride, Styrene, and Xylenes.
  - Changes have been made to chronic target organs to the following substances with no change to health factors: Diethanolamine, Fluorides and Hydrogen Fluoride, and Xylenes.
  - The "date added" in this table reflects the date of the health factor only. See footnotes below that discuss changes to substance target organs only.
- On June 27, 2014, OEHHA adopted a new 8-hour REL and revised acute and chronic RELs for benzene. The REL values and summary can be found at: http://www.oehha.ca.gov/air/chronic_rels/BenzeneJune2014.html.
- On March 28, 2016, OEHHA adopted new and revised RELs for toluene diisocyanate (TDI) and methylene diphenyl diisocyanate (MDI). The REL values and summaries can be found at: http://www.oehha.ca.gov/air/chronic_rels/032816TDI_MDI_RELs.html.
- On February 21, 2017, OEHHA adopted new acute, 8-hour, and chronic inhalation RELs for carbonyl sulfide. The REL values and summary can be found at: http://oehha.ca.gov/air/crnr/notice-adoption-reference-exposure-levels-carbonyl-sulfide.
- On May 4, 2018, OEHHA adopted new 8-hour and chronic inhalation RELs, and a revised acute REL for ethylene glycol butyl ether. The REL values and summary can be found at: https://oehha.ca.gov/air/chemicals/ethylene-glycol-monobutyl-ether.

Footnotes
ACUTE, 8-HOUR, AND CHRONIC REFERENCE EXPOSURE LEVELS AND TARGET ORGANS

	• On September 6, 2019, OEHHA adopted new RELs for hexamethylene diisocyanate. The REL values and summary can be found at: https://oehha.ca.gov/air/crnr/notice-adoption-reference-exposure-levels-hexamethylene-diisocyanate. • On August 20, 2020, OEHHA adopted new and revised RELs for toluene. The REL values and summary can be found at: https://oehha.ca.gov/air/crnr/notice-adoption-reference-exposure-levels-toluene. • On August 31, 2022, OEHHA adopted new RELs for trivalent chromium. The REL values and summary can be found at: https://oehha.ca.gov/air/document/chromium-trivalent-inorganic-water-soluble-compounds-reference-exposure-levels-rels. • August 2022 [8/22] is listed to reflect the new pollutants that were added to Appendix A-1: *Substances for Which Emissions Must be Quantified in the 2022 Emission Inventory Criteria Guidelines* (https://ww2.arb.ca.gov/our-work/programs/ab-2588-air-toxics-hot-spots/hot-spots-inventory-guidelines). OEHHA was consulted to determine which existing health values may be applied to these new pollutants. Health values were added for 61 pollutants on August 31, 2022. OEHHA was also consulted on the appropriate MWAF, if applicable. • Selenium hexafluoride (7783-79-1): The health values for fluorides were applied to selenium hexafluoride. Selenium also has a set of health values; however, the Hot Spots Analysis and Reporting Program (HARP) software can only apply one set of health values for each pollutant. To account for the additional toxicity of selenium, the MWAF default is 1.
d	February 2014. Per OEHHA's current policy, substances with Reproductive System and/or Development as the hazard Index target organ(s) are represented under the single endpoint "Reproductive/Development"
e	Particulate Emissions from Diesel-Fueled Engines: The inhalation cancer potency factor was derived from whole diesel exhaust and should be used only for impacts from the inhalation pathway (based on diesel PM measurements). The inhalation impacts from speciated emissions from diesel-fueled engines are already accounted for in the inhalation cancer potency factor and REL. However, at the discretion of the risk assessor, speciated emissions from diesel-fueled engines may be used to estimate acute noncancer health impacts or the contribution to cancer risk or chronic noncancer health impacts for the non-inhalation exposure pathway. The noncancer chronic REL for diesel exhaust is based on assumptions of contributions of diesel PM to ambient PM. It should be used with diesel PM measurement. There is not an oral chronic REL for diesel exhaust. See Appendix D of OEHHA's document *The Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments* for more information.
f	Polychlorinated Dibenzo-p-dioxins and Polychlorinated Dibenzofurans (also referred to as chlorinated dioxins and dibenzofurans) and dioxin-like PCB congeners: The OEHHA has adopted the World Health Organization 2005 (WHO-05) Toxicity Equivalency Factor scheme for evaluating the risk due to exposure to samples containing mixtures of polychlorinated dibenzo-p-dioxins (PCDD) and polychlorinated dibenzofurans (PCDF) and a number of dioxin-like PCB congeners. See Appendix A of OEHHA's *Technical Support Document for Describing Available Cancer Potency Factors* for more information about the scheme. See Appendix C (revised 01/20/11) of OEHHA's *Technical Support Document: Methodologies for Derivation*, Listing of Available Values, and Adjustments to Allow for Early Life Exposures (2009) online at http://oehha.ca.gov/air/hot_spots/tsd052909.html for more information about the scheme.
g	Polychlorinated Biphenyls (unspeciated): As of February 2014, there is no approved method that can be used to assess the noncancer hazard of an unspeciated PCB mixture. Persons preparing HRAs for the Hot Spots Program should consult with OEHHA and the local Air Pollution Control or Air Quality Management District if an assessment of the noncancer hazard for unspeciated PCB mixtures is needed.
h	SELENIUM AND COMPOUNDS: In February 2014, a chronic oral REL was added to the consolidated table. The REL was adopted in December 2001 but could not be used by the Hot Spots Program (or HARP software) until transfer factors for the oral and dermal routes were adopted. Transfer factors were included in the OEHHA's *Technical Support Document for Exposure Assessment and Stochastic Analysis* (August 2012) and were added to the HARP software in March 2015.
i	1,6-HEXAMETHYLENE DIISOCYANATE (HDI): On September 19, 2019, acute, 8-hour, and chronic RELs were added to these tables and to the Hot Spots Analysis and Reporting Program (HARP) software for the HDI (monomer). OEHHA adopted these RELs and others for HDI polyisocyanates on September 6, 2019. The Acute, 8-hour, and chronic RELs for HDI polyisocyanates were added to the consolidated table and HARP on August 31, 2022.
TAC	Toxic Air Contaminant: The Air Resources Board has identified this substance as a Toxic Air Contaminant (https://ww2.arb.ca.gov/resources/documents/carb-identified-toxic-air-contaminants).
N/A	Not Applicable.

Footnotes
ACUTE, 8-HOUR, AND CHRONIC REFERENCE EXPOSURE LEVELS AND TARGET ORGANS

Other Changes:

Acute Table: February 2014 corrections based on original REL summaries:

- Chloroform – added respiratory system as a target organ.
- Methylene chloride – the cardiovascular system was added as a target organ.
- Entry of SULFURIC ACID AND OLEUM is removed to be consistent with Consolidated Table 1. This entry is removed from Table 1 because oleum represents only an acute health hazard.
- Styrene – added reproductive/development as a target organ.
- Xylenes – add nervous system as a target organ.

Chronic Table: February 2014 corrections based on original REL summaries:

- Removed applicability of oleum to the sulfuric acid chronic inhalation REL because oleum represents only an acute health hazard.
- Diethanolamine – deleted cardiovascular and nervous system as target organs, and added hematologic and respiratory systems as target organs.
- Fluorides and Hydrogen Fluoride – target organ for these substances was reconfigured so that “Bone and Teeth” are a combined target organ.
- Xylenes (mixed isomers) – added eye as a target organ.
- Removed “METHYL MERCURY (see Mercury & Compounds)” entry because methyl mercury has different chemical properties, potency, and toxicity compared to elemental mercury and mercury salts, and it is not emitted directly from any California facilities.
- September 1, 2017, changed the “1101 Fluorides” entry back to “1101 Fluorides and compounds” to keep the consistency with the Emission Inventory Guidelines. The substance name for CAS# 1101 was changed from “Fluorides and compounds” as in 2002 to “Fluorides” in 2003 without footnotes about the change.