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AIR TOXICS PROGRAM
AMBIENT BENCHMARK CONCENTRATIONS (ABC)

CASRN	CHEMICAL NAME	ABC ($\mu g\ m^{-3}$)	DERIVATION
75-07-0	ACETALDEHYDE [CANCER] ‡	0.45 {2} †	ABC calculated using the 1997 USEPA IRIS URE of 2.2×10^{-6}. OEHHA URE is similar (2.7×10^{-6}), newer (1999), and would give a similar ABC (0.37). Choice of ABC based on preference for USEPA toxicity information.
107-02-8	ACROLEIN [NON-CANCER]	0.02	ABC is the 2002 USEPA IRIS RfC. OEHHA REL is higher (0.06) and older (2001). Choice of ABC based on preference for USEPA toxicity information, which is also newer.
107-13-1	ACRYLONITRILE [CANCER]	0.01 {2}	ABC calculated using the 1991 USEPA IRIS URE of 6.8×10^{-5}. OEHHA URE is higher (2.9×10^{-4}), newer (1999), and would give a lower ABC (0.003). OEHHA analysis was more recent but based on the same study used by USEPA. Choice of ABC based on preference for USEPA toxicity information, because the ATSAC did not accept the uncertainty factors applied by OEHHA.
7664-41-7	AMMONIA [NON-CANCER]	200	ABC is the 2000 OEHHA REL. USEPA IRIS RfC is lower (100) and older (1991). Choice of ABC based on preference for newer OEHHA toxicity data.
7440-38-2	ARSENIC [CANCER]	0.0002 {4}	ABC calculated using the 1997 USEPA IRIS URE of 4.3×10^{-3} for elemental As. OEHHA URE is lower 3.3×10^{-3}, older (1990), and would give a similar ABC (0.0003). Choice of ABC based on preference for USEPA toxicity information.

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CASRN	CHEMICAL NAME	ABC ($\mu g\ m^{-3}$)	DERIVATION
71-43-2	BENZENE [CANCER]	0.13 {2}	ABC calculated using the high end (7.8×10^{-6}) of the 2000 USEPA IRIS URE range. OAQPS also uses the high end of the USEPA IRIS URE range. OEHHA URE is higher (2.9×10^{-5}), older (1985), and would give a lower (0.03) ABC. Choice of ABC based on preference for USEPA (OAQPS) toxicity information.
7440-41-7	BERYLLIUM [CANCER]	0.0004 {4}	ABC calculated using the 1998 USEPA IRIS URE of 2.4×10^{-3}. Both OEHHA and NATA 1999 use this URE. Choice of ABC based on preference for USEPA toxicity information.
106-99-0	1,3-BUTADIENE [CANCER]	0.03 {2}	ABC calculated using the 2003 USEPA IRIS URE of 3.0×10^{-5}. OEHHA URE is higher (1.7×10^{-4}), older (1992), and would give a lower (0.006) ABC. Choice of ABC based on preference for USEPA toxicity information, which is also newer.
7440-43-9 1306-19-0	CADMIUM CADMIUM FUMES [CANCER]	0.0006 {4}	ABC calculated using the 1998 USEPA IRIS URE of 1.8×10^{-3}. OEHHA URE is higher (4.2×10^{-3}), older (1974-1987), and would give a lower (0.0002) ABC. The OEHHA REL is 0.02. Choice of ABC based on preference for USEPA toxicity information, which is also newer.
75-15-0	CARBON DISULFIDE [NON-CANCER]	800	ABC is the 2002 OEHHA REL. USEPA IRIS RfC is lower (700) and older (1995). Choice of ABC based on the newer OEHHA value.

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CASRN	CHEMICAL NAME	ABC ($\mu g\ m^{-3}$)	DERIVATION
56-23-5	CARBON TETRACHLORIDE [CANCER]	0.07 {2}	ABC calculated using the 1991 USEPA IRIS URE of 1.5×10^{-5}. OEHHA URE is higher (4.2×10^{-5}), older (1987), and would give a lower (0.024) ABC. Choice of ABC based on preference for USEPA toxicity information, which is also newer.
7782-50-5	CHLORINE [NON-CANCER]	0.2	ABC is the 2000 OEHHA REL. Same RfC is used by NATA 1999. Choice of ABC based on only available toxicity information, which is also consistent with that used by USEPA.
67-66-3	CHLOROFORM [NON-CANCER]	98	ABC is the 1998 ATSDR MRL. USEPA IRIS uses ATSDR MRL (which dates from 1976) because of low confidence in potency estimates. OEHHA REL is higher (300) and newer (2000) but is not an inhalation study. ATSAC had low confidence in the OEHHA cancer study. Choice of ABC based on only available toxicity information.
18540-29-9	CHROMIUM, HEXAVALENT [CANCER]	0.00008 {5}	ABC calculated using the 1998 USEPA IRIS URE of 1.2×10^{-2}. OEHHA URE is higher (1.5×10^{-1}), older (1986), and would give a lower (0.0000067) ABC. Choice of ABC based on preference for USEPA toxicity information, which is also newer.
7440-48-4	COBALT COMPOUNDS [NON-CANCER]	0.1	ABC is the 2001 ATSDR MRL. Same RfC is used by OEHHA and NATA 1999. Choice of ABC based on only available toxicity information, which is also consistent with that used by USEPA.

CASRN	CHEMICAL NAME	ABC ($\mu g\ m^{-3}$)	DERIVATION
106-46-7	1,4-DICHLOROBENZENE [CANCER]	0.09 {2}	ABC calculated using the 1999 OEHHA URE of 1.1×10^{-5}. Same URE is used by NATA 1999. Choice of ABC based on only available toxicity information, which is also consistent with that used by USEPA.
542-75-6	1,3-DICHLOROPROPENE [CANCER]	0.25 {2}	ABC calculated using the 2000 USEPA IRIS URE of 4.0×10^{-6}. There is no OEHHA URE. Same URE is used by NATA 1999. Choice of ABC based on preference for USEPA toxicity information.
(none)	DIESEL PARTICULATE MATTER [CANCER]	0.1	ABC is the highest credible value reflecting the carcinogenic potential of this material. The 2003 USEPA IRIS RfC is 5; NATA 1999 uses this RfC; there is no URE. The 1998 OEHHA REL is 5, their 1998 URE is of 3.4×10^{-4} (which would give an ABC of 0.003). Choice of ABC based on an extensive review and discussion of the available literature and best professional judgment on the part of the ATSAC. The selected value is close to that suggested by the World Health Organization.
1746-01-6	DIOXINS & FURANS, CHLORINATED [CANCER]	3.0E-08 {8}	ABC calculated using the 1999 OEHHA URE of 38. OAQPS uses the lower (33) and older (1994) USEPA ORD URE, which would give the same (3.0E-08) ABC. The measured mean total dioxin ambient concentration in Oregon is 51.3 femtograms (5.1×10^{-14} g), close to the benchmark value (3.0×10^{-14} g) Choice based on newer OEHHA toxicity information for children.

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CASRN	CHEMICAL NAME	ABC ($\mu g\ m^{-3}$)	DERIVATION
100-41-4	ETHYL BENZENE [CANCER]	0.4	ABC calculated using the 2007 OEHHA URE of 2.5×10^{-6}. 1991 USEPA IRIS RfC of 3000. Choice of ABC based on newer and lower CalEPA value derived from recent studies demonstrating carcinogenicity. Adopted by EQC, 19 Aug 2010
106-93-4	ETHYLENE DIBROMIDE [CANCER]	0.002 {3}	ABC calculated using the 2004 USEPA IRIS URE of 6.0×10^{-4}. OEHHA URE is lower (7.1×10^{-5}), older (1985), and would give a higher (0.01) ABC. Choice of ABC based on preference for USEPA toxicity information, which is also newer.
107-06-2	ETHYLENE DICHLORIDE [CANCER]	0.04 {2}	ABC calculated using the 2004 USEPA IRIS URE of 2.6×10^{-5}. OEHHA URE is lower (2.1×10^{-5}), older (1985), and would give a higher (0.05) ABC. Choice of ABC based on preference for USEPA toxicity information, which is also newer.
75-21-8	ETHYLENE OXIDE [CANCER]	0.01 {2}	ABC calculated using the 1987 OEHHA URE of 8.8×10^{-5}. Same URE is used by NATA 1999. Choice of ABC based on only available toxicity information, which is also consistent with that used by USEPA.
50-00-0	FORMALDEHYDE [NON-CANCER]	3	ABC is the 2000 OEHHA REL. OAQPS uses the higher (9.8) and older (1999) ATSDR MRL. The USEPA IRIS URE of 1.30×10^{-5} gives a benchmark of 0.07; the OEHHA URE of 6.0×10^{-6} a benchmark of 0.17; the CIIT URE of 5.5×10^{-9} gives a benchmark of 182. Choice of ABC based on the newer OEHHA REL until the cancer potency issue is fully resolved by USEPA.

CASRN	CHEMICAL NAME	ABC ($\mu g\ m^{-3}$)	DERIVATION
110-54-3	n-HEXANE [NON-CANCER]	7000	ABC is the 2000 OEHHA REL. USEPA IRIS RfC is lower (200) and older (1991). OEHHA discredited USEPA study due to confounding presence of acetone. Choice of ABC based on newer OEHHA toxicity information.
7647-01-0	HYDROGEN CHLORIDE [NON-CANCER]	20	ABC is the 1995 USEPA IRIS RfC value. OEHHA REL is lower (9) and newer (2000). Both USEPA and OEHHA relied on the same study but used different analysis assumptions. Choice of ABC based on preference for newer USEPA toxicity information, because the ATSAC did not accept the uncertainty factors applied by OEHHA.
74-90-8	HYDROGEN CYANIDE [NON-CANCER]	9	ABC is the 2000 OEHHA REL. USEPA IRIS RfC is lower (3) and older (1994). Choice of ABC based on newer OEHHA toxicity information.
7664-39-3	HYDROGEN FLUORIDE [NON-CANCER]	14	ABC is the 2003 OEHHA REL. OAQPS uses this RfC but NATA 1999 uses an older (1999) and higher (30) California RfC. Both OEHHA and USEPA based values on same study but USEPA had added uncertainty because multi-generational study was lacking. Choice of ABC based on newer, multi-generational OEHHA toxicity information.

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CASRN	CHEMICAL NAME	ABC ($\mu g\ m^{-3}$)	DERIVATION
7783-06-4	HYDROGEN SULFIDE [NON-CANCER]	2	ABC is the 2003 USEPA IRIS RfC. OEHHA REL is higher (10) and older (2000). The ATSDR intermediate duration MRL is 28. Choice of ABC based on preference for USEPA toxicity information, which is also newer.
7439-92-1	LEAD COMPOUNDS [NON-CANCER]	0.15	ABC based on National Ambient Air Quality Standard (NAAQS) adopted by USEPA in 2008.
7439-96-5	MANGANESE COMPOUNDS [NON-CANCER]	0.09	ABC is the 2008 OEHHA REL, which reflects greater susceptibility of children to Mn. USEPA IRIS RfC is lower (0.05) and older (1993). Both OEHHA and USEPA values based on same study of inhalation but with different uncertainty factors. Choice of ABC based on newer OEHHA toxicity information.
7439-97-6	MERCURY (ELEMENTAL) [NON-CANCER]	0.3	ABC is 1995 USEPA IRIS RfC for elemental Hg. OAQPS uses the USEPA IRIS RfC, while NATA 1999 uses the newer (2000) and lower (0.09) OEHHA REL. Both USEPA and OEHHA based RfC on same study but with different uncertainty factors. Choice of ABC based on an extensive review and discussion of the available literature and best professional judgment on the part of the ATSAC.
67-56-1	METHANOL [NON-CANCER]	4000	ABC is the 2000 OEHHA REL. Same RfC is used by NATA 1999. Choice of ABC based on only available toxicity information.

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CASRN	CHEMICAL NAME	ABC ($\mu g\ m^{-3}$)	DERIVATION
74-83-9	METHYL BROMIDE [NON-CANCER]	5	ABC is the 1992 USEPA IRIS RfC. OEHHA REL is the same (5) and newer (2000). Choice of ABC based on preference for USEPA toxicity information, which is consistent with OEHHA.
74-87-3	METHYL CHLORIDE [NON-CANCER]	90	ABC is the 2001 USEPA IRIS RfC. Same RfC is used by NATA 1999. ATSDR MRL is 95. Choice of ABC based on only available toxicity information.
71-55-6	METHYL CHLOROFORM [NON-CANCER]	1000	ABC is the 2000 OEHHA REL. NATA 1999 also uses this RfC. There is no USEPA IRIS value. Choice of ABC based on only available toxicity information, which is also consistent with that used by USEPA.
75-09-2	METHYLENE CHLORIDE [CANCER]	2.1 {1}	ABC calculated using the 1997 USEPA IRIS URE of 4.7×10^{-7}. OEHHA URE is higher (1.0×10^{-6}), older (1989), and would give a lower (1.0) ABC (because a USDA adjustment divided the value by 2). Choice of ABC based on preference for USEPA toxicity information, which is also newer.
91-20-3	NAPHTHALENE [CANCER]	0.03 {2}	ABC calculated using the 2004 OEHHA URE of 3.4×10^{-5}. Both OEHHA and NATA 1999 use this URE. Choice of ABC based on only available toxicity information, which is also consistent with that used by USEPA.

CASRN	CHEMICAL NAME	ABC ($\mu g\ m^{-3}$)	DERIVATION
(none)	NICKEL REFINERY DUST [CANCER]	0.004 {3}	ABC calculated using the 1991 USEPA IRIS URE of 2.4×10^{-4} for nickel refinery dust. The OEHHA URE is almost identical (2.6×10^{-4}), the same age (1991), and would give the same (0.004) ABC. The 2004 USEPA OAQPS uses a URE of 1.6×10^{-4}) which would give an ABC of 0.004. Choice of ABC based on preference for USEPA toxicity information, which is also consistent with OEHHA.
12035-72-2	NICKEL SUBSULFIDE [CANCER]	0.002 {3}	ABC calculated using the 1991 USEPA IRIS URE of 4.8×10^{-4} for nickel subsulfide. OEHHA groups this with other Ni compounds with a value of 0.05. Choice of ABC based on preference for USEPA toxicity information.
	NICKEL COMPOUNDS (SOLUBLE) [NON-CANCER]	0.05	ABC is the 2000 OEHHA REL. ATSDR (2005) has chronic MRL of 0.09 based on nickel sulfate. USEPA has no inhalation values for these compounds. OAQPS uses the ATSDR value. Choice of ABC based on OEHHA toxicity information when USEPA information was not available.
373-02-4	Nickel acetate		
7718-54-9	Nickel chloride		
3333-39-3	Nickel carbonate		
13463-39-3	Nickel carbonyl		
12054-48-7	Nickel hydroxide		
1271-28-9	Nickelocene		
7786-81-4	Nickel sulfate		
7803-51-2	PHOSPHINE [NON-CANCER]	0.3	ABC is the 1995 USEPA IRIS RfC. OEHHA REL is higher (0.8) and newer (2002). Choice of ABC based on USEPA information because the ATSAC did not accept the uncertainty factors applied by OEHHA.

CASRN	CHEMICAL NAME	ABC ($\mu g\ m^{-3}$)	DERIVATION
7664-38-2	PHOSPHORIC ACID [NON-CANCER]	10	ABC is the 2004 USEPA IRIS RfC. OEHHA REL is higher (70) and older (2000). Choice of ABC based on preference for USEPA toxicity information, which is also newer.
1336-36-3	POLYCHLORINATED BIPHENYLS (PCB) [CANCER]	0.01 {2}	ABC calculated using the 1999 USEPA IRIS URE of 1.0×10^{-4}. ABC is for total PCB. OEHHA URE for high risk PCB group is higher (5.7×10^{-4}), the same age (1999), and would give a lower (0.002) ABC. Choice of ABC based on preference for USEPA toxicity information.
various	POLYCYCLIC AROMATIC HYDROCARBONS (PAH) [CANCER]	0.0009 {4}	ABC calculated using the 1999 OEHHA URE of 1.1×10^{-3} for benzo(a)pyrene. Benchmark is compared to the toxicity equivalency factor weighted sum of concentrations for 32 individual PAHs. Choice of ABC based on only available toxicity information.
127-18-4	TETRACHLOROETHYLENE [CANCER]	35	ABC is the 1991 OEHHA REL. There is no USEPA IRIS RfC. The 1999 ATSDR chronic inhalation MRL is 270. The 1991 OEHHA URE is 5.9×10^{-6}; NATA 1999 and OEHHA 1999 use a URE of 5.0×10^{-6}. OAQPS 2005 and NATA 1999 use the ATSDR MRL and the OEHHA URE. Choice of ABC based on OEHHA REL due to lack of clear evidence of significant cancer potency in humans.
108-88-3	TOLUENE [NON-CANCER]	400	ABC is the 1995 USEPA IRIS RfC. OEHHA REL is lower (300) and newer (2000). ATSDR MRL is 376. Choice of ABC based on preference for USEPA toxicity information, which is similar to that used by ATSDR.

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CASRN	CHEMICAL NAME	ABC ($\mu g\ m^{-3}$)	DERIVATION
26471-62-5	2,4-/2,6-TOLUENE DIISOCYANATE (MIXTURE) [NON-CANCER]	0.07	ABC is the 1995 USEPA IRIS RfC. OEHHA REL is the same and newer (1999). An ABC calculated using the 1999 OEHHA URE of 1.1×10^{-5} would be higher (0.09). Choice of ABC based on preference for USEPA toxicity information.
79-01-6	TRICHLOROETHYLENE [CANCER]	0.5 {1}	ABC calculated using the 1990 OEHHA URE of 2.0×10^{-6}. OAQPS 2005 and NATA 1999 also use this URE. Choice of ABC based on preference for USEPA toxicity information for air quality programs.
75-01-4	VINYL CHLORIDE [CANCER]	0.1 {1}	ABC calculated using the 2000 USEPA IRIS URE of 8.8×10^{-6}. OEHHA URE is higher (7.8×10^{-5}), older (1990) and would give a lower (0.01) ABC. Guidance must indicate that this be used with an Early Life Stage adjustment factor. Choice of ABC based on preference for USEPA toxicity information, which is also newer.
7723-14-0	WHITE PHOSPHORUS [NON-CANCER]	0.07	ABC is the 1991 OEHHA REL. Choice of ABC based on only available toxicity information.
1330-20-7	XYLENES (MIXED) [NON-CANCER]	700	ABC is the 2000 OEHHA REL. USEPA IRIS RfC is lower (100) and newer (2003). Choice of ABC is based on the OEHHA human (LOAEL) study, rather than the USEPA animal-only study.

NOTES

‡ Indicates health effect endpoint on which benchmark is based; not a statement regarding the carcinogenicity of any air toxic.

† Benchmark values for carcinogens are calculated as 1×10^{-6} (acceptable risk level) ÷ URE.

Number in superscript brackets { } indicates the number of decimal places to which the result was rounded using the Excel® ROUND() function.

ACRONYMS

ABC	Ambient benchmark concentration for Oregon
ATSAC	Air Toxics Science Advisory Committee (for DEQ's Air Quality Division)
ATSDR	Agency for Toxic Substances and Disease Registry (part of U.S. Public Health Service)
CalEPA	California Environmental Protection Agency
CIIT	Chemical Industry Institute of Toxicology
DEQ	Oregon Department of Environmental Quality
IRIS	Integrated Risk Information System
MRL	Minimum risk level
NATA	National Air Toxics Assessment (by USEPA)
OAQPS	USEPA Office of Air Quality Planning and Standards
OEHHA	Office of Environmental Health Hazard Assessment (within CalEPA)
ORD	Office of Research and Development (USEPA)
REL	Reference exposure level
RfC	Reference concentration
URE	Unit risk estimate
USEPA	U. S. Environmental Protection Agency